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*Hypothesis*

# Search for Sources of Systematic Error in Astrometric Measurements of the Cosmological Constant

Michael Overholt

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**Abstract:** Among the theoretical problems with the prevailing theory of cosmology, Lambda Cold Dark Matter ( $\Lambda$ CDM), the most serious appears to be the twofold problem with the cosmological constant  $\lambda$ : Dark Energy and Hubble Tension. Despite a two-decade search for systematic errors in astrometry the problems have not been resolved. This paper posits a potential source of error that may have affected astrometry related to the current and past measurements of  $\lambda$ .

**Keywords:**  $\lambda$ CDM; dark energy; cosmological constant; hubble tension

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## 1. Introduction

The results of the 1998 study published by Dr. Saul Perlmutter et al. [1], and the 2004 study from Dr. Adam Reis et al. [2] presented a view of Big Bang cosmology that was, and remains unsatisfying. Though both papers presented theoretically rigorous and well reasoned arguments for a “dark energy” acceleration of the universe, their conclusions published in their respective papers rest upon data from fewer than 80 type 1a Supernova (SNe 1a).

In statistical analysis, a result is only considered reliable if the sample data is representative of the population under study. Considering the literally universal size of the stellar population, 80 is a miniscule number of samples upon which to base such an important conclusion. To do so must rest on at least two simplifying assumptions:

1. The expansion of the universe is isotropic. Thus, a sample of any size must be representative of the full population spanning the same distance and age.
2. The velocity of the local reference frame is known and effectively constant throughout the span of history covered by the observations, or any change would be too small to affect the results and may be ignored.

The estimated 3 kilometer per second discrepancy between two rigorous measurements of  $\lambda$  known as “The Hubble Tension” is similarly unsatisfying. If  $\lambda$  is increasing over time, then the current measurement is just a present-day snapshot, not necessarily a reflection of  $\lambda$  through history.

## 2. Methods

These widely acknowledged theoretical problems motivated a deeper look into astrometry concerning dark energy. To address the small dataset problem, we used as many of the stars listed in the SAI Supernova Catalog [3] as possible. To challenge the simplifying assumptions, we segregated the SNe 1a into directional cohorts by right ascension (RA) and compared the uncorrected red shift (RS)-luminosity relations.

The local Earth, solar system, Milky Way [4] reference frame is known to be moving roughly toward the Shapley Galactic Supercluster [5], and the more distant Great Attractor [6] with a velocity of approximately 630km/s [7]. We selected only confirmed SNe 1a from the catalog, then chose the RAs toward the Great Attractor (RAs 14-17), and those diametrically opposed (RAs 2-5) for the test

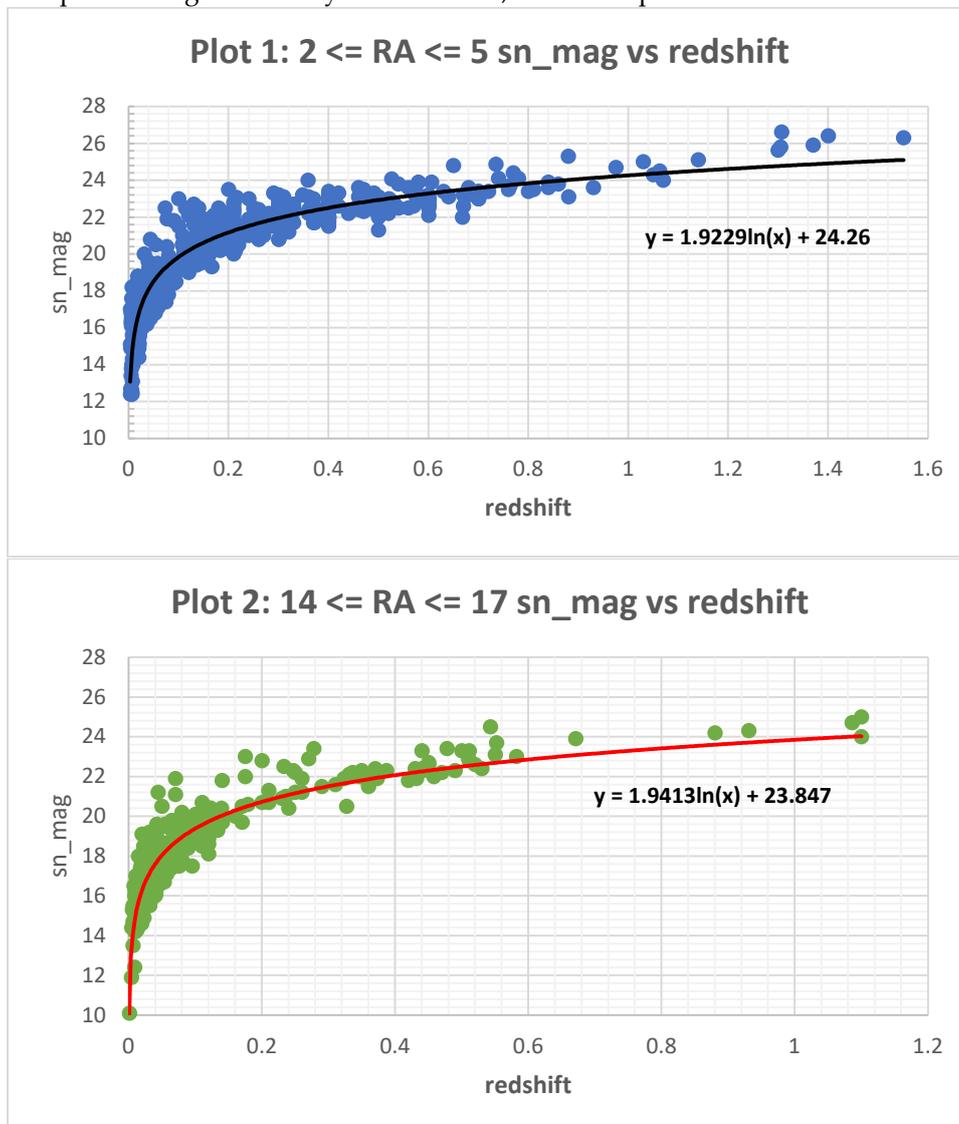
comparison. For the control comparison we used two cohorts at right angle RAs 8-11 and 20-23. The data used to create the plots are found in the [Data](#) section.

### 3. Research

We plotted the redshift-luminosity relation for the low-RA and high RA cohorts of the test group. The positive velocity of the Milky Way of 630kps is additive to the distance from the low-RA cohort and subtractive to the distance from the high-RA stars. If the expansion of the universe is isotropic, and if the velocity of the Milky Way has been constant through the period under study, that would introduce a fixed offset to the redshift-luminosity (RSL) plots when compared. The plots should not converge.

However, if the Milky Way has positively accelerated on its current heading it would produce a plot with a larger difference in the RSL plots in the recent past that converges in the distant past. Conversely, a negative acceleration would produce a smaller difference in the RSL plots in the recent past.

The first pass through the data yielded similar, too-dense plots from data found here and here :



**Figure 1.**

In plots 1 and 2 note that the low RA plot trends 2 magnitudes higher (lower luminosity) than the high RA plot at redshift (RS) near 0, but the two plots converge, possibly intersecting beyond

redshift=1.6 as shown in Table 1. This pair of plots hypothetically illustrates a potentially consequential acceleration of our galaxy during the last 480 million years or more.

**Table 1.** Unfiltered Test Cohort Trendline Magnitudes calculated from SAI Supernova Catalog SNe 1a Measurements.

| Index | 14..17 sn_mag | 2..5 sn_mag | diff     |
|-------|---------------|-------------|----------|
| 0.05  | 18.03138494   | 18.4995064  | 0.468121 |
| 0.1   | 19.37699156   | 19.8323591  | 0.455368 |
| 0.15  | 20.16412097   | 20.612028   | 0.447907 |
| 0.2   | 20.72259818   | 21.1652118  | 0.442614 |
| 0.25  | 21.15578676   | 21.5942946  | 0.438508 |
| 0.3   | 21.50972759   | 21.9448807  | 0.435153 |
| 0.35  | 21.80898031   | 22.241297   | 0.432317 |
| 0.4   | 22.0682048    | 22.4980646  | 0.42986  |
| 0.45  | 22.29685701   | 22.7245496  | 0.427693 |
| 0.5   | 22.50139338   | 22.9271473  | 0.425754 |
| 0.55  | 22.68641903   | 23.1104192  | 0.424    |
| 0.6   | 22.85533422   | 23.2777334  | 0.422399 |
| 0.65  | 23.01072112   | 23.4316475  | 0.420926 |
| 0.7   | 23.15458693   | 23.5741498  | 0.419563 |
| 0.75  | 23.28852279   | 23.7068161  | 0.418293 |
| 0.8   | 23.41381142   | 23.8309173  | 0.417106 |
| 0.85  | 23.531502     | 23.9474924  | 0.41599  |
| 0.9   | 23.64246363   | 24.0574023  | 0.414939 |
| 0.95  | 23.74742433   | 24.1613681  | 0.413944 |
| 1     | 23.847        | 24.26       | 0.413    |
| 1.1   | 24.03202565   | 24.4432719  | 0.411246 |
| 1.2   | 24.20094084   | 24.6105861  | 0.409645 |
| 1.3   | 24.35632775   | 24.7645002  | 0.408172 |
| 1.4   | 24.50019355   | 24.9070025  | 0.406809 |
| 1.5   | 24.63412941   | 25.0396689  | 0.405539 |
| 1.6   | 24.75941805   | 25.16377    | 0.404352 |

A sharper focus on low-redshift supernovae yielded these plots from data [here](#) and [here](#):

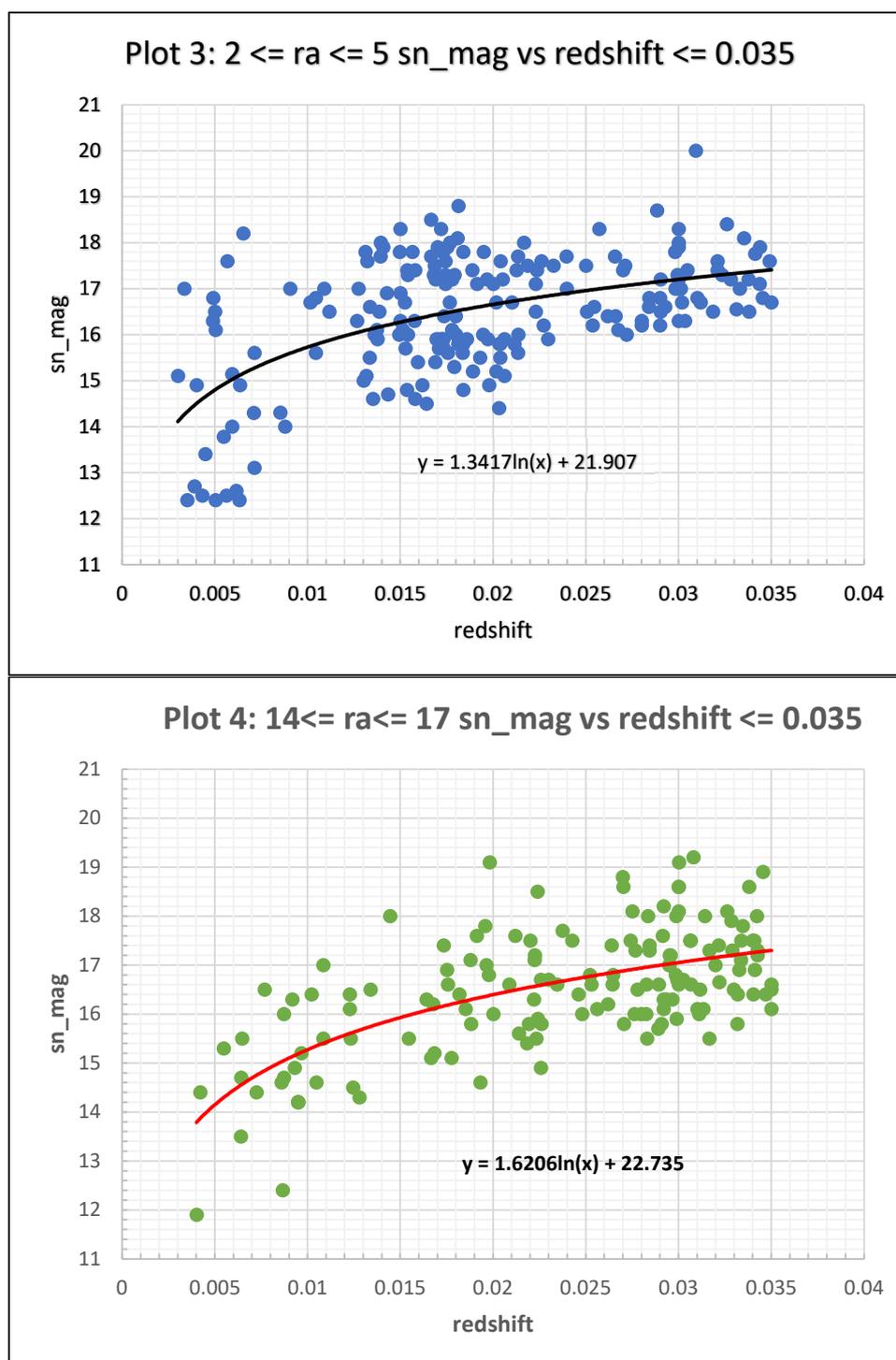


Figure 2.

Since lambda is common mode in these two plots, any difference must be due to motion of the local reference frame. We know that the Milky Way is moving away from the low RA stars toward the high RA stars which exaggerates the change over time by a factor of two. Since there is much more data in the low RA set, and it is difficult to line up individual stars for direct comparison, we used the trend lines to filter the data in both sets to the exemplars of each trend from data found here and here:

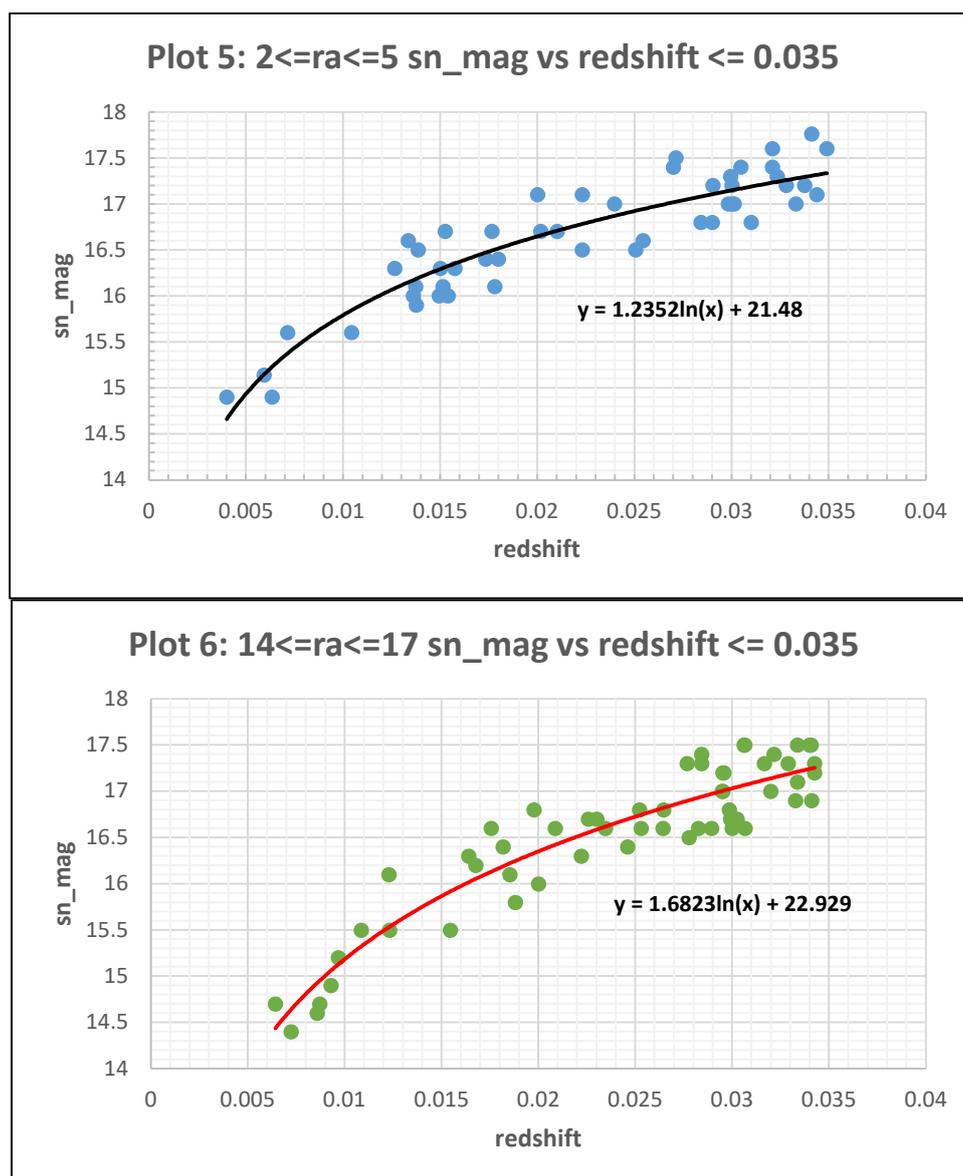


Figure 3.

Note that though the trends appear to be quite similar, the high RA trend begins 0.002 to the right on the X or redshift axis, yet the traces nearly converge at RS = 0.035 as shown in Table 2.

**Table 2.** Exemplar Trendline sn\_mag vs redshift  $\leq 0.035$  calculated from SAI Supernova Catalog SNe Ia Measurements.

| Index | index       | index       | diff     |
|-------|-------------|-------------|----------|
| 0.005 | 14.93022007 | 14.01564069 | 0.914579 |
| 0.01  | 15.78708862 | 15.1817222  | 0.605366 |
| 0.015 | 16.28832458 | 15.86383615 | 0.424488 |
| 0.02  | 16.64395716 | 16.3478037  | 0.296153 |
| 0.025 | 16.91980722 | 16.72319809 | 0.196609 |
| 0.03  | 17.14519313 | 17.02991765 | 0.115275 |
| 0.035 | 17.3357542  | 17.28924534 | 0.046509 |

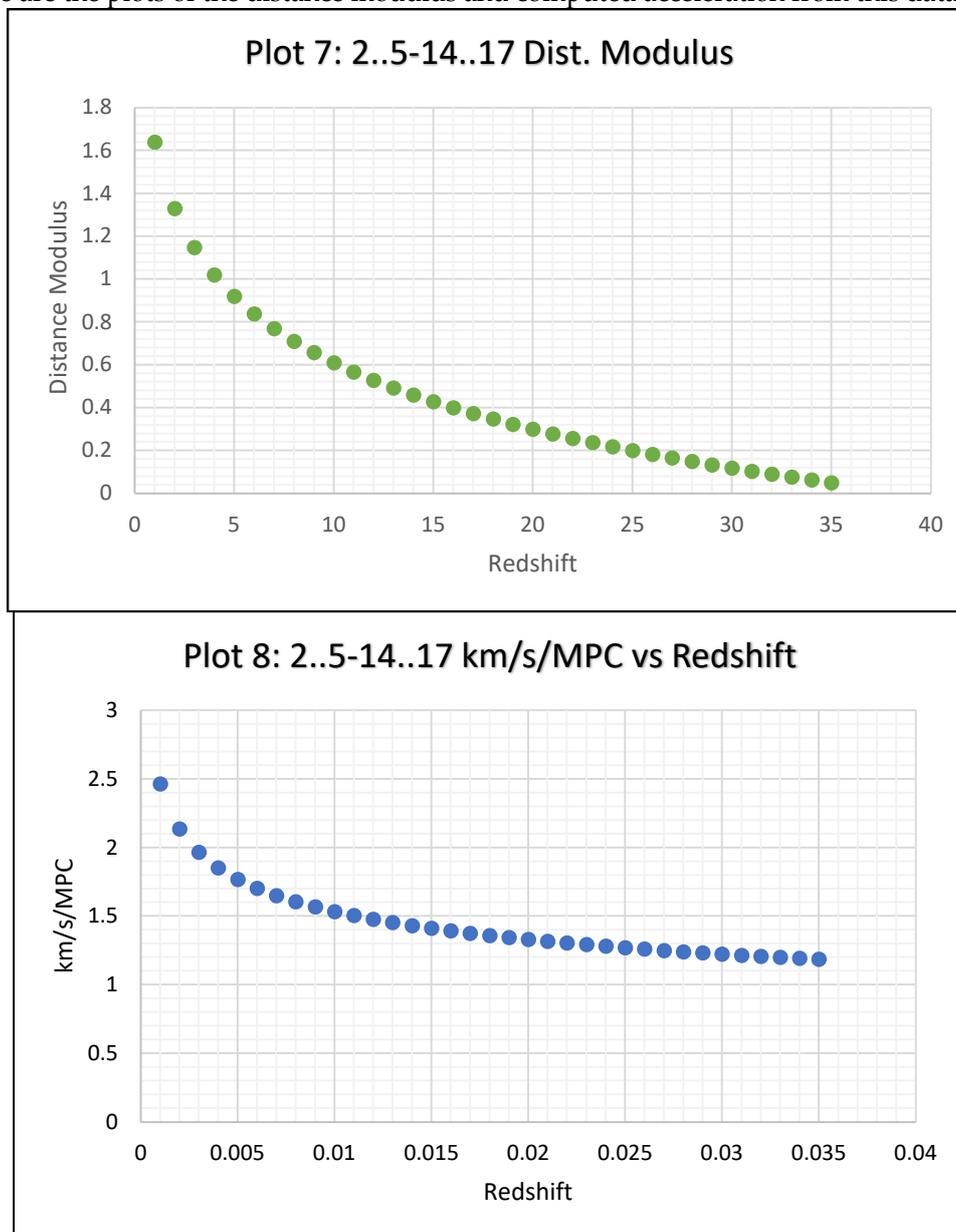
Stars still cannot be compared directly, but we can use the trend line equations to make straightforward comparisons at each redshift in the interval of interest. Each 0.001 of RS is equivalent to approximately 13.8 million years. By using the high RA magnitude as the absolute magnitude, and the low RA magnitude as the apparent magnitude at each 0.001 interval in the trendline equations

we can obtain regular changes in distance measurements in approximately 13.8-million-year intervals over the last 480 million years with this formula:

$$m - M + 1$$

$$d = 10^5$$

Here are the plots of the distance modulus and computed acceleration from this data:



**Figure 4.**

Plot 8 shows the computed change in velocity of the Milky Way during the last 480 million years. After correction for doubling of the separation distance, this plot shows that over the most recent 13.8-million-year period the velocity of the Milky Way increased by an average of 2.43 km/s every 3.3 million years, and increasingly less in the past.

Plots of the control cohorts RA 8..11 and RA 20..23 are distinctly different in appearance than test plots 1 and 2 using data found here and here:

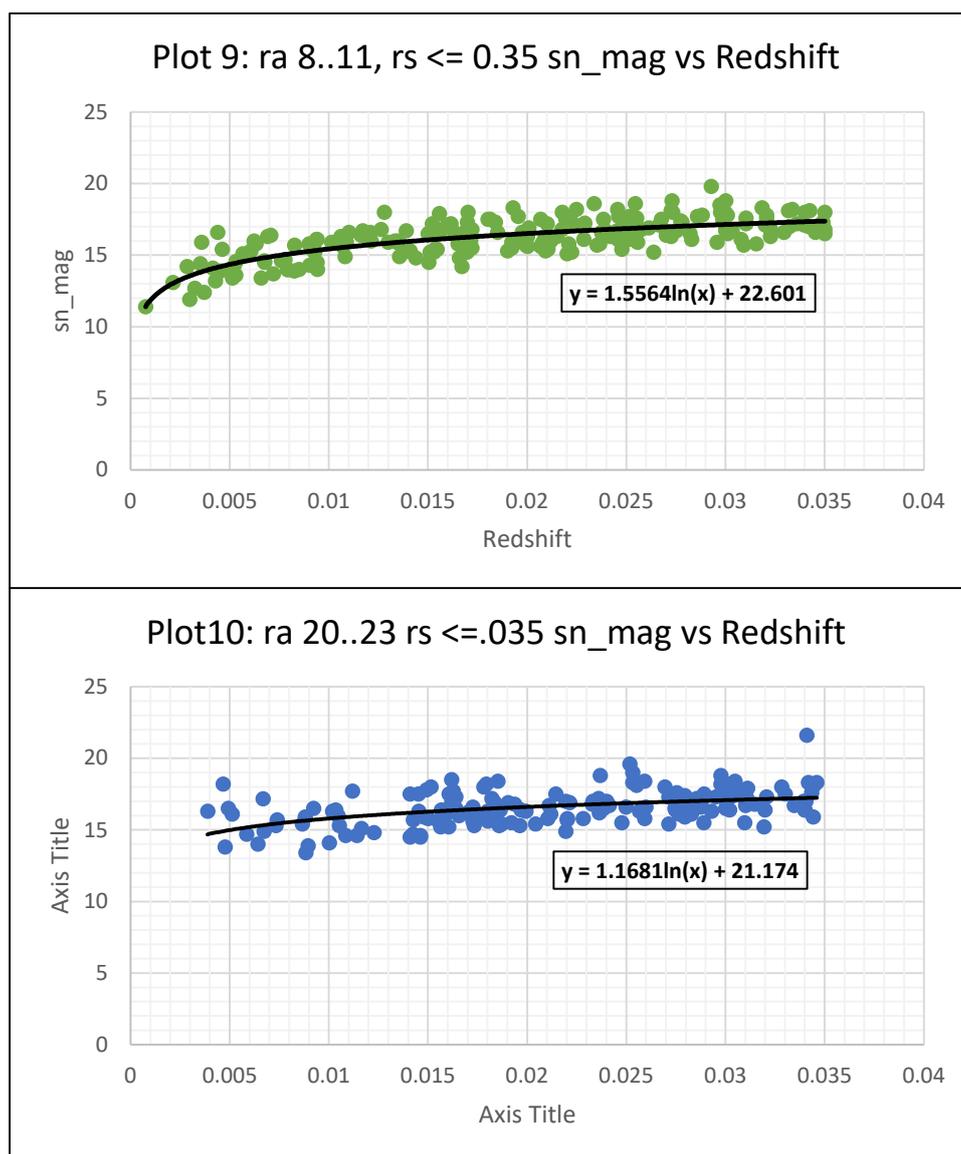


Figure 5.

We used the SNe 1a observations in the control cohorts without filtering outliers. The 20..23 cohort contains no observations below redshift = 0.03. As a result, the trendlines are substantially different below redshift 0.1 but rapidly converge as expected of observations roughly 90 degrees from our galaxy's heading as shown in Table 3.

**Table 3.** Unfiltered Control Cohort RA<=0.035 Trendline Magnitudes calculated from SAI Supernova Catalog SNe 1a Measurements.

| Index | 20..23 sn_mag | 8..11 sn_mag | diff     |
|-------|---------------|--------------|----------|
| 0.005 | 14.98503548   | 14.35469885  | 0.630337 |
| 0.01  | 15.79470071   | 15.43351312  | 0.361188 |
| 0.015 | 16.2683245    | 16.06457902  | 0.203745 |
| 0.02  | 16.60436593   | 16.51232739  | 0.092039 |
| 0.025 | 16.86501991   | 16.85962802  | 0.005392 |
| 0.03  | 17.07798972   | 17.14339329  | -0.0654  |
| 0.035 | 17.25805313   | 17.38331341  | -0.12526 |

#### 4. Discussion

Our search of papers concerning dark energy and the Hubble tension provided no evidence that astrometric measurements of them did not implicitly assume that the local reference frame is inertial. While a purely statistical analysis that treats SNe 1a observations as a random population could not disprove that assumption, we believe that it does support a hypothesis to that effect.

If the local reference frame is currently accelerating at nearly 2.5kps/MPC, it could be consequential to the dark energy results if the data contains a selection bias in favor of SNe 1a with RAs in the range 2..5. In fact, that is the case in the results from Perlmutter et al. [1] and Reis et al. [2]. Of the 60 SNe 1a in tables 1 & 2 in Perlmutter, 14 have right ascensions in the range 2..5, only 1 in the range 14..17. Of the 16 SNe 1a in Reis Table 1, fully half are in range 2..5, and none are from 14..17. Hypothetically, data from RA range 2..5 used in isolation under an assumption that the local reference frame is inertial would clearly present as an increase in lambda. As a substantial fraction of the data in the Perlmutter and Reis studies they would bias the results more subtly. Recent measurements of lambda closer to 3 kilometers per second renders the measurements here somewhat more compelling.

However, this investigation is a relatively unsophisticated statistical analysis of raw, uncorrected SAI SNe 1a measurements. Though there is plenty of data, it is of unknown quality. The finding of recent acceleration could be due to noise in the data. Despite this, an acceleration of the local reference frame coupled with a very small data set and selection bias is a simpler explanation for an apparent acceleration of the expansion of the universe than dark energy. We believe that the hypothesis presented is the simplest explanation for the finding of a relatively recent increase in lambda and is sufficiently credible to merit further investigation.

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**Availability of Data and Materials:** All data used in this paper is included in the Data section.

**Ethics Approval and Consent to Participate:** Not applicable.

**Consent for Publication:** Not applicable.

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**Conflict of Interest:** The author declares that he has no conflict of interest.

## Appendix A. Data

All data below is directly from or adapted from the SAI Supernova Catalog.

**Table A1.** Plot 1 Data from The SAI Supernova Catalog.

| sn_name | redshift | sn_mag | sn_type | sn_ra       | sn_dec      |
|---------|----------|--------|---------|-------------|-------------|
| 2006rv  | 0.11     | 19.5   | Ia      | 02 00 00.71 | 56 15.0     |
| 2004fz  | 0.017308 | 15.9   | Ia      | 02 01 06.41 | 52 44.2     |
| 1998dj  | 0.013602 | 16     | Ia      | 02 01 06.92 | - 6 49 04.8 |
| 2006nl  | 0.19     | 21.8   | Ia      | 02 01 44.71 | - 1 01 56.7 |
| 2004dt  | 0.019707 | 15.9   | Ia      | 02 02 12.77 | - 0 05 51.5 |
| 2011gk  | 0.044077 | 18     | Ia      | 02 02 19.02 | 39 39.6     |
| 2007jw  | 0.136953 | 21.6   | Ia      | 02 02 32.74 | - 1 05 21.0 |
| 2006nw  | 0.16     | 21.3   | Ia      | 02 02 55.95 | - 0 32 01.9 |
| 2005gt  | 0.279997 | 22     | Ia:     | 02 04 03.84 | - 0 21 57.0 |
| 2006tg  | 0.52     | 22.2   | Ia      | 02 04 14.17 | - 4 40 18.7 |
| 2006ef  | 0.017894 | 15.3   | Ia      | 02 04 19.51 | - 8 43 42.2 |
| 2007uq  | 0.4      | 23     | Ia      | 02 04 21.31 | - 3 54 10.9 |
| 2007td  | 0.3      | 23     | Ia      | 02 04 26.90 | - 3 44 18.9 |
| 2004ha  | 0.499999 | 23     | Ia      | 02 04 27.00 | - 4 52 46.0 |

|        |          |      |       |             |             |
|--------|----------|------|-------|-------------|-------------|
| 2008er | 0.016648 | 18.5 | Ia    | 02 04 36.27 | 56 10.4     |
| 2002jr | 0.4      | 22.7 | Ia    | 02 04 41.03 | - 5 09 40.7 |
| 2005fs | 0.329998 | 21.7 | Ia    | 02 04 52.97 | - 0 19 35.2 |
| 2004hz | 0.142998 | 20.1 | Ia    | 02 05 03.00 | 0 50 11.9   |
| 2007mn | 0.076999 | 21.9 | Ia    | 02 05 03.96 | 0 10 28.4   |
| 2003R  | 0.668    | 22   | Ia    | 02 05 11.27 | - 4 42 30.0 |
| 2007tv | 0.3      | 23   | Ia    | 02 05 13.33 | - 5 01 42.5 |
| 2007tw | 0.6      | 23   | Ia    | 02 05 32.97 | - 5 02 46.6 |
| 2006tn | 0.67     | 23.2 | Ia    | 02 05 36.03 | - 5 08 46.3 |
| 2003Q  | 0.21     | 20   | Ia    | 02 05 47.55 | - 4 52 48.0 |
| 2007ni | 0.21     | 21.8 | Ia    | 02 05 50.39 | - 0 19 54.7 |
| 2006mi | 0.7      | 23.4 | Ia    | 02 05 55.04 | - 4 00 53.2 |
| 2012U  | 0.019772 | 14.9 | Ia    | 02 06 04.33 | -55 11 37.5 |
| 2007tm | 0.5      | 23   | Ia    | 02 06 04.74 | - 3 32 29.3 |
| 2007uh | 0.6      | 23   | Ia    | 02 06 05.20 | - 4 01 37.5 |
| 2007tg | 0.5      | 23   | Ia    | 02 06 10.51 | - 4 42 23.2 |
| 2004ee | 0.020509 | 17.2 | Ia    | 02 06 14.62 | -37 20 05.4 |
| 2006sn | 0.4      | 23   | Ia    | 02 06 18.25 | - 4 51 33.1 |
| 2004hh | 0.199998 | 21.4 | Ia    | 02 06 25.01 | - 4 38 04.0 |
| 2007hx | 0.08     | 19.5 | Ia    | 02 06 27.08 | - 0 53 58.3 |
| 2006sb | 0.3      | 20.8 | Ia    | 02 06 30.31 | - 4 05 30.6 |
| 2007uf | 0.5      | 23   | Ia    | 02 06 30.88 | - 4 09 55.0 |
| 2006sq | 0.2      | 23.5 | Ia    | 02 07 11.63 | - 3 57 10.9 |
| 2007ul | 0.6      | 23   | Ia    | 02 07 16.54 | - 4 42 23.2 |
| 2006ia | 0.174964 | 21   | Ia    | 02 07 19.18 | 1 15 07.5   |
| 2007ub | 0.5      | 23   | Ia    | 02 07 24.14 | - 3 51 55.2 |
| 2002jc | 0.499999 | 23.1 | Ia    | 02 07 27.28 | - 3 50 20.7 |
| 2012hq | 0.09     | 18.4 | Ia    | 02 07 30.50 | 06 19.3     |
| 2006to | 0.68     | 23.2 | Ia    | 02 07 34.39 | - 4 00 04.2 |
| 2007pt | 0.18     | 20.5 | Ia    | 02 07 38.51 | - 0 19 26.4 |
| 2006od | 0.17     | 22.1 | Ia    | 02 07 54.31 | - 0 32 07.4 |
| 2003ji | 0.199998 | 20.9 | Ia    | 02 07 54.84 | - 3 28 28.4 |
| 2004hb | 0.699997 | 23.4 | Ia    | 02 08 09.70 | - 4 41 51.8 |
| 2006sf | 0.6      | 22.5 | Ia    | 02 08 11.65 | - 3 51 40.2 |
| 2006lw | 0.2      | 21.5 | Ia    | 02 08 33.67 | - 3 57 12.9 |
| 2004hi | 0.399996 | 22.4 | Ia    | 02 08 38.82 | - 5 08 11.7 |
| 2007ur | 0.3      | 23   | Ia    | 02 08 41.59 | - 3 34 10.6 |
| 2004hd | 0.499999 | 22.5 | Ia    | 02 08 48.21 | - 4 26 10.4 |
| 2006mj | 0.7      | 23.1 | Ia    | 02 09 03.04 | - 3 28 27.8 |
| 2006sh | 0.3      | 23.2 | Ia    | 02 09 11.06 | - 3 44 42.0 |
| 2006tp | 0.72     | 23.4 | Ia    | 02 09 14.04 | - 4 37 12.2 |
| 2003kn | 0.199998 | 21.3 | Ia    | 02 09 15.55 | - 3 35 41.4 |
| 2009le | 0.017791 | 16.1 | Ia    | 02 09 17.14 | -23 24 44.8 |
| 2003em | 0.017791 | 17.2 | Ia    | 02 09 20.23 | -23 24 53.0 |
| 2007te | 0.4      | 23   | Ia    | 02 09 29.40 | - 3 35 35.0 |
| 2007qd | 0.04313  | 20.8 | IaPec | 02 09 33.56 | - 1 00 02.2 |
| 2004hs | 0.399996 | 23.1 | Ia    | 02 09 33.69 | - 4 13 04.0 |
| 2004hp | 0.499999 | 22   | Ia    | 02 09 35.52 | - 3 46 23.5 |
| 2007ug | 0.7      | 23   | Ia    | 02 09 36.85 | - 4 51 52.2 |
| 2003kv | 0.8      | 23.4 | Ia    | 02 09 42.52 | - 3 46 48.6 |

|        |          |      |       |             |             |
|--------|----------|------|-------|-------------|-------------|
| 2005jp | 0.209998 | 21.2 | Ia    | 02 09 50.39 | - 0 03 42.3 |
| 2006si | 0.5      | 22.6 | Ia    | 02 09 51.33 | - 3 43 32.5 |
| 2000ea | 0.42     | 23.3 | Ia    | 02 09 54.02 | - 5 28 17.8 |
| 2007up | 0.6      | 23   | Ia    | 02 09 56.07 | - 4 28 57.4 |
| 2001ds | 0.036435 | 16.2 | Ia:   | 02 10 08.73 | 42 20.3     |
| 2007ti | 0.5      | 23   | Ia    | 02 10 09.84 | - 4 39 49.3 |
| 2006sc | 0.4      | 21.8 | Ia    | 02 10 10.23 | - 4 44 12.5 |
| 2007uc | 0.6      | 23   | Ia    | 02 10 15.53 | - 4 04 06.5 |
| 2006ts | 0.56     | 22.5 | Ia    | 02 10 18.69 | - 3 32 26.3 |
| 2003lh | 0.499999 | 22.7 | Ia    | 02 10 19.51 | - 4 59 32.3 |
| 2006sj | 0.7      | 23   | Ia    | 02 10 22.42 | - 3 33 09.3 |
| 2000eb | 0.68     | 23.6 | Ia    | 02 10 25.75 | - 5 25 33.7 |
| 2006sk | 0.3      | 21.6 | Ia    | 02 10 33.80 | - 4 04 03.9 |
| 2006tt | 0.63     | 23.4 | Ia    | 02 10 47.93 | - 4 24 56.9 |
| 2003jy | 0.3      | 22.7 | Ia    | 02 10 53.98 | - 4 25 49.8 |
| 2007th | 0.5      | 23   | Ia    | 02 10 57.57 | - 5 00 24.9 |
| 2007tj | 0.3      | 23   | Ia    | 02 11 04.61 | - 4 11 50.0 |
| 2003ko | 0.4      | 21.7 | Ia    | 02 11 06.48 | - 3 47 56.1 |
| 2006kp | 0.29     | 23.3 | Ia:   | 02 11 11.66 | 0 41 45.0   |
| 2003lk | 0.4      | 22.8 | Ia    | 02 11 12.82 | - 4 13 52.1 |
| 2006na | 0.32     | 22   | Ia    | 02 11 19.07 | - 0 59 53.7 |
| 2000ec | 0.469998 | 22.7 | Ia    | 02 11 32.03 | - 4 13 56.1 |
| 2007je | 0.16     | 21.2 | Ia    | 02 11 47.31 | - 0 54 44.8 |
| 1996bj | 0.570001 | 22.6 | Ia    | 02 11 49.53 | 1 24 51.0   |
| 2001ec | 0.045361 | 17.8 | Ia    | 02 12 00.43 | 32 43.8     |
| 2009fu | 0.017066 | 15.7 | Ia    | 02 12 09.10 | 33 55.1     |
| 1996bf | 0.249999 | 21.5 | Ia    | 02 12 15.39 | 1 27 48.9   |
| 2005ml | 0.12     | 19   | Ia    | 02 14 04.42 | - 0 14 21.1 |
| 2013et | 0.057159 | 17.4 | Ia    | 02 14 17.04 | 7 35 12.1   |
| 2006kw | 0.19     | 21.2 | Ia    | 02 14 57.98 | 0 36 09.0   |
| 2006ot | 0.052939 | 17.4 | Ia    | 02 15 04.84 | -20 45 58.2 |
| 2007sc | 0.27     | 22.1 | Ia    | 02 15 11.87 | 0 32 09.3   |
| 2009ns | 0.05     | 16.9 | Ia    | 02 15 37.60 | - 3 25 41.0 |
| 2004ih | 0.153999 | 20   | Ia    | 02 15 54.31 | 1 04 09.9   |
| 2006ri | 0.09     | 19.6 | Ia    | 02 15 57.44 | -21 54 19.4 |
| 2002km | 0.605999 | 23.9 | Ia    | 02 16 23.93 | - 4 49 29.4 |
| 2007pn | 0.31     | 22.5 | Ia:   | 02 16 33.90 | - 0 43 20.5 |
| 2006lq | 0.32     | 22.2 | Ia    | 02 16 35.88 | - 0 09 18.5 |
| 2002kn | 1.03     | 25   | Ia    | 02 16 45.71 | - 5 09 51.2 |
| 2002ko | 0.569997 | 23.4 | Ia    | 02 17 00.05 | - 4 58 19.6 |
| 2005ey | 0.129999 | 19.5 | Ia    | 02 17 05.50 | 0 16 49.0   |
| 2005jd | 0.319998 | 21.6 | Ia    | 02 17 06.20 | 0 32 05.4   |
| 2002kr | 1.063    | 24.5 | Ia    | 02 17 34.51 | - 4 53 46.6 |
| 2004ia | 0.143721 | 19.5 | Ia    | 02 18 02.30 | - 0 33 32.4 |
| 2010kq | 0.026596 | 16.4 | Ia    | 02 18 10.92 | 05 42.4     |
| 2005ge | 0.189998 | 21.2 | Ia:   | 02 18 14.72 | 0 47 47.6   |
| 2002hu | 0.03     | 16.3 | Ia    | 02 18 20.06 | 27 58.8     |
| 2006ka | 0.25     | 21.9 | Ia    | 02 18 26.68 | 0 13 36.0   |
| 2000dx | 0.030345 | 16.3 | Ia    | 02 18 26.88 | 5 39 02.0   |
| 2005dm | 0.016838 | 17.5 | IaPec | 02 18 39.25 | - 6 54 10.8 |

|        |          |      |        |             |             |
|--------|----------|------|--------|-------------|-------------|
| 2011hk | 0.017554 | 15.6 | IaPec  | 02 18 45.79 | - 6 38 30.6 |
| 2007J  | 0.016788 | 17.3 | IbPec: | 02 18 51.70 | 43 43.3     |
| 2005ie | 0.279997 | 21.5 | Ia     | 02 19 02.54 | - 0 16 22.2 |
| 2007ps | 0.25     | 21.8 | Ia     | 02 19 13.53 | - 0 23 05.4 |
| 2002iv | 0.199998 | 20.9 | Ia     | 02 19 16.11 | - 7 44 06.7 |
| 2010be | 0.183    | 20.2 | Ia     | 02 19 46.55 | - 3 12 10.5 |
| 2002ju | 0.3      | 21.6 | Ia     | 02 20 11.00 | - 9 04 37.5 |
| 2002js | 0.4      | 22.9 | Ia     | 02 20 35.39 | - 9 34 43.9 |
| 2006km | 0.3      | 22   | Ia     | 02 20 37.93 | 0 20 54.2   |
| 2007pe | 0.3      | 21.8 | Ia     | 02 21 04.01 | 0 29 47.1   |
| 2006sy | 0.21     | 22.6 | Ia     | 02 21 05.20 | 0 49 42.2   |
| 2009kv | 0.32     | 21.2 | Ia     | 02 21 06.60 | - 5 01 23.8 |
| 2009kx | 0.23     | 21   | Ia     | 02 21 13.75 | - 3 54 35.8 |
| 2007rl | 0.33     | 22.5 | Ia     | 02 21 33.07 | - 0 22 29.7 |
| 2007rm | 0.3      | 22.7 | Ia     | 02 21 45.09 | 0 51 52.1   |
| 2013A  | 0.033805 | 16.5 | Ia     | 02 22 04.27 | 13 57.7     |
| 2006ra | 0.13     | 19.8 | Ia     | 02 22 24.92 | 5 22 01.3   |
| 2009kz | 0.27     | 21   | Ia     | 02 22 40.07 | - 4 01 38.3 |
| 2013fb | 0.016939 | 15.9 | Ia     | 02 22 42.07 | 16 01.0     |
| 2006ce | 0.005026 | 12.4 | Ia     | 02 22 54.63 | -21 14 29.4 |
| 2007jr | 0.09     | 18.8 | Ia     | 02 22 57.28 | 1 01 32.7   |
| 2011H  | 0.021331 | 15.6 | Ia     | 02 23 06.02 | 02 32.4     |
| 2006jw | 0.25     | 22.5 | Ia:    | 02 23 22.30 | 0 49 08.4   |
| 2010L  | 0.07     | 18.5 | Ia     | 02 23 28.78 | 5 35 30.6   |
| 2007ou | 0.113228 | 22.5 | Ia     | 02 23 42.69 | - 0 49 33.6 |
| 2012ie | 0.048    | 18   | Ia     | 02 24 22.35 | 51 03.2     |
| 2005ky | 0.147999 | 21   | Ia     | 02 24 36.25 | - 4 10 54.9 |
| 2011ik | 0.033758 | 17.2 | Ia     | 02 25 04.09 | 12 51.9     |
| 2001kh | 0.219998 | 21   | Ia     | 02 25 15.56 | - 5 23 20.0 |
| 2006rr | 0.13     | 19.7 | Ia     | 02 25 28.59 | 7 17 02.5   |
| 2008hs | 0.017413 | 17.3 | Ia     | 02 25 29.62 | 50 35.1     |
| 2007ng | 0.4      | 23.2 | Ia     | 02 25 38.10 | 0 42 34.5   |
| 2006em | 0.018866 | 17.4 | IaPec  | 02 25 44.30 | 56 31.8     |
| 2011ek | 0.005031 | 16.1 | Ia     | 02 25 48.89 | 31 59.8     |
| 2002eh | 0.017974 | 16.4 | Ia     | 02 26 08.45 | 54 45.2     |
| 2007E  | 0.022962 | 15.9 | Ia     | 02 26 34.41 | -15 50 36.5 |
| 2001il | 0.208    | 20.4 | Ia     | 02 26 41.35 | - 0 57 31.7 |
| 2006nb | 0.21     | 22.8 | Ia     | 02 26 53.40 | - 0 19 40.1 |
| 2010gy | 0.06     | 18.4 | Ia     | 02 27 12.04 | - 4 32 04.9 |
| 2002gr | 0.089998 | 21.8 | Ia     | 02 27 13.22 | 0 53 57.8   |
| 2006pt | 0.3      | 22.1 | Ia     | 02 27 16.17 | - 0 23 36.5 |
| 2000ee | 0.469998 | 22.6 | Ia     | 02 27 34.53 | 1 11 49.4   |
| 2003gs | 0.004478 | 13.4 | IaPec  | 02 27 38.36 | - 1 09 35.4 |
| 2005eu | 0.034897 | 17.6 | Ia     | 02 27 43.26 | 10 36.6     |
| 2008id | 0.26     | 20.8 | Ia     | 02 27 46.80 | - 4 34 47.1 |
| 2003li | 0.499999 | 22.8 | Ia     | 02 27 47.29 | - 7 33 46.2 |
| 2001ga | 0.129999 | 19.5 | Ia     | 02 27 51.76 | 0 37 20.9   |
| 2007us | 0.6      | 23   | Ia     | 02 27 54.87 | - 8 00 55.2 |
| 1999fh | 0.359999 | 22.4 | Ia     | 02 27 58.33 | 0 39 36.8   |
| 2004hm | 0.199998 | 21.5 | Ia     | 02 28 03.11 | - 7 42 29.7 |

|        |          |      |    |             |             |
|--------|----------|------|----|-------------|-------------|
| 1999fi | 0.779999 | 24.1 | Ia | 02 28 11.67 | 0 43 39.3   |
| 1999fj | 0.81     | 23.5 | Ia | 02 28 23.72 | 0 39 09.6   |
| 2007ok | 0.17     | 21.3 | Ia | 02 28 24.27 | 0 11 04.8   |
| 2009kt | 0.27     | 21.5 | Ia | 02 28 28.37 | - 4 04 44.1 |
| 2003jl | 0.4      | 22.4 | Ia | 02 28 28.56 | - 8 08 44.7 |
| 2006tr | 0.58     | 23.2 | Ia | 02 28 29.54 | - 7 53 28.5 |
| 2007jt | 0.14     | 20.4 | Ia | 02 28 32.78 | - 1 02 31.6 |
| 2007tx | 0.7      | 23   | Ia | 02 28 33.31 | - 8 35 25.7 |
| 2007ty | 0.5      | 23   | Ia | 02 28 34.38 | - 8 23 49.5 |
| 2004fr | 0.199998 | 22.2 | Ia | 02 28 43.77 | - 8 54 24.0 |
| 2003jm | 0.499999 | 22.9 | Ia | 02 28 50.93 | - 9 09 58.1 |
| 1999fk | 1.05     | 24.3 | Ia | 02 28 53.88 | 1 16 24.2   |
| 2001if | 0.037637 | 17.2 | Ia | 02 28 54.93 | 05 52.7     |
| 2001jh | 0.880609 | 23.1 | Ia | 02 29 00.29 | 0 20 44.2   |
| 2000ga | 0.140714 | 20   | Ia | 02 29 03.73 | - 8 24 13.7 |
| 2003jn | 0.299997 | 20.8 | Ia | 02 29 21.21 | - 9 02 15.6 |
| 2007tq | 0.1      | 23   | Ia | 02 29 23.34 | - 7 52 27.7 |
| 2004hj | 0.399996 | 21.5 | Ia | 02 29 41.93 | - 8 43 49.4 |
| 2007to | 0.6      | 23   | Ia | 02 29 42.06 | - 9 02 05.2 |
| 2004he | 0.599998 | 23   | Ia | 02 29 48.79 | - 8 20 45.9 |
| 2003js | 0.4      | 22   | Ia | 02 29 52.15 | - 8 32 28.1 |
| 2006tu | 0.44     | 22.2 | Ia | 02 29 56.54 | - 7 59 50.8 |
| 2002jw | 0.4      | 22.8 | Ia | 02 30 00.52 | - 8 36 22.4 |
| 2007tz | 0.5      | 23   | Ia | 02 30 07.15 | - 8 43 09.3 |
| 2003km | 0.3      | 21.8 | Ia | 02 30 09.00 | - 9 04 35.9 |
| 2007uw | 0.4      | 23   | Ia | 02 30 09.80 | - 7 40 49.1 |
| 2006lx | 0.3      | 22.3 | Ia | 02 30 10.38 | - 8 06 54.0 |
| 2007ud | 0.6      | 23   | Ia | 02 30 13.15 | - 9 15 39.5 |
| 2006mk | 0.3      | 22.4 | Ia | 02 30 16.91 | - 8 40 47.3 |
| 2004hq | 0.699997 | 23.1 | Ia | 02 30 18.04 | - 8 22 25.0 |
| 2000eg | 0.54     | 22.5 | Ia | 02 30 21.05 | 1 03 48.5   |
| 2007ut | 0.4      | 23   | Ia | 02 30 23.64 | - 9 12 20.0 |
| 2007tp | 0.5      | 23   | Ia | 02 30 23.94 | - 9 13 39.9 |
| 2007tk | 0.3      | 23   | Ia | 02 30 24.61 | - 8 17 54.4 |
| 1999fm | 0.93     | 23.6 | Ia | 02 30 35.62 | 1 09 43.3   |
| 2006mf | 0.2      | 20.9 | Ia | 02 30 37.32 | - 7 57 04.4 |
| 2002iy | 0.499999 | 21.3 | Ia | 02 30 40.00 | - 8 11 40.5 |
| 2005A  | 0.019138 | 17.1 | Ia | 02 30 43.25 | - 2 56 19.8 |
| 2012fk | 0.035    | 16.7 | Ia | 02 30 52.04 | 28 45.9     |
| 2006mb | 0.3      | 21.6 | Ia | 02 30 54.30 | - 8 57 42.1 |
| 2006mv | 0.17     | 21.9 | Ia | 02 30 55.46 | 0 56 46.7   |
| 2003kp | 0.600001 | 22.1 | Ia | 02 31 02.64 | - 8 39 50.8 |
| 2003kq | 0.600001 | 22.6 | Ia | 02 31 04.09 | - 8 10 56.6 |
| 2005ev | 0.0154   | 16   | Ia | 02 31 04.93 | 42 06.5     |
| 2003jw | 0.3      | 22.6 | Ia | 02 31 06.84 | - 8 45 36.5 |
| 2004fs | 0.499999 | 22.6 | Ia | 02 31 19.95 | - 8 49 21.7 |
| 2002iz | 0.399996 | 22.1 | Ia | 02 31 20.73 | - 8 36 13.1 |
| 2003kr | 0.399996 | 22   | Ia | 02 31 20.96 | - 8 36 14.2 |
| 2003ks | 0.499999 | 22.2 | Ia | 02 31 34.54 | - 8 36 46.4 |
| 2006mg | 0.4      | 21.9 | Ia | 02 31 37.75 | - 8 06 40.2 |

|        |          |      |        |             |             |
|--------|----------|------|--------|-------------|-------------|
| 1999gp | 0.026744 | 16.1 | Ia     | 02 31 39.15 | 22 52.3     |
| 2002gx | 0.079998 | 19   | Ia     | 02 31 44.69 | 16 39.5     |
| 2003jt | 0.4      | 22   | Ia     | 02 31 54.60 | - 8 35 48.4 |
| 2004hf | 0.399996 | 22   | Ia     | 02 32 00.14 | - 8 42 23.8 |
| 2009hn | 0.021855 | 17.5 | Ia     | 02 32 00.31 | 1 14 53.5   |
| 2006mc | 0.4      | 22.3 | Ia     | 02 32 02.61 | - 9 07 21.2 |
| 2006sl | 0.4      | 22.3 | Ia     | 02 32 15.95 | - 8 48 34.3 |
| 2006pa | 0.25     | 22   | Ia:    | 02 32 23.95 | - 0 42 48.9 |
| 2010A  | 0.020334 | 15.8 | Ia     | 02 32 39.46 | 0 37 10.2   |
| 1999es | 0.069998 | 18.5 | Ia     | 02 32 43.40 | 27 08.0     |
| 2007uj | 0.3      | 23   | Ia     | 02 33 19.03 | - 8 32 30.2 |
| 2012E  | 0.020384 | 15.5 | Ia     | 02 33 22.81 | 9 35 05.9   |
| 2012hm | 0.036248 | 17.8 | Ia     | 02 33 23.32 | 40 16.9     |
| 2006sm | 0.6      | 22.6 | Ia     | 02 33 29.49 | - 8 30 11.9 |
| 2004ft | 0.499999 | 22.4 | Ia     | 02 33 32.63 | - 8 09 34.1 |
| 2007ir | 0.035304 | 17.4 | Ia     | 02 33 41.90 | 40 08.2     |
| 2003kt | 0.600001 | 22.8 | Ia     | 02 33 47.01 | - 8 36 22.1 |
| 2006so | 0.1      | 21.5 | Ia     | 02 33 49.16 | - 8 59 15.8 |
| 2005gv | 0.359999 | 22.2 | Ia     | 02 33 54.13 | 0 16 50.6   |
| 1999ff | 0.460001 | 23.1 | Ia     | 02 33 54.39 | 0 32 55.6   |
| 2002fi | 0.057164 | 18.3 | Ia     | 02 33 54.40 | -21 02 29.4 |
| 1999dq | 0.014329 | 14.7 | IaPec  | 02 33 59.68 | 58 30.4     |
| 2008fk | 0.072    | 18.4 | Ia     | 02 34 05.06 | 1 23 42.5   |
| 1997dp | 0.01496  | 17.8 | Ia     | 02 34 06.48 | 56 13.4     |
| 2008J  | 0.015941 | 15.4 | IInPec | 02 34 24.20 | -10 50 38.5 |
| 2002jf | 0.078997 | 17.8 | Ia     | 02 34 35.43 | 17 25.4     |
| 2006ly | 0.3      | 21.9 | Ia     | 02 34 42.38 | - 8 30 39.9 |
| 2004hg | 0.599998 | 22.7 | Ia     | 02 34 55.19 | - 8 30 43.6 |
| 2007ui | 0.4      | 23   | Ia     | 02 34 57.12 | - 8 04 00.2 |
| 2005je | 0.093939 | 19   | Ia:    | 02 35 26.62 | 1 04 29.6   |
| 2006tv | 0.76     | 23.5 | Ia     | 02 35 34.23 | - 8 34 22.0 |
| 2003ll | 0.600001 | 23.2 | Ia     | 02 35 41.19 | - 8 06 29.6 |
| 2006hs | 0.259999 | 22.4 | Ia     | 02 36 04.86 | - 0 59 39.0 |
| 2007ns | 0.37     | 22.5 | Ia     | 02 37 02.97 | - 0 51 59.8 |
| 2007hf | 0.051432 | 18.6 | Ia     | 02 37 28.26 | -23 32 04.7 |
| 2001eu | 0.135093 | 19.4 | Ia     | 02 37 58.80 | - 1 01 40.1 |
| 2009ig | 0.008773 | 14   | Ia     | 02 38 11.61 | - 1 18 45.1 |
| 2006lr | 0.26     | 21.9 | Ia     | 02 38 52.96 | 0 05 24.3   |
| 1994am | 0.372    | 21.7 | Ia     | 02 40 02.06 | - 1 37 14.9 |
| 1994H  | 0.373998 | 21.9 | Ia     | 02 40 04.73 | - 1 34 06.6 |
| 1999eo | 0.079998 | 19.6 | Ia     | 02 40 13.20 | 4 54 53.3   |
| 2002gt | 0.369999 | 21.7 | Ia     | 02 40 29.78 | - 0 22 46.0 |
| 2006nh | 0.37     | 23   | Ia     | 02 40 50.57 | 0 39 31.6   |
| 2005hi | 0.074998 | 18.9 | Ia     | 02 41 00.24 | 42 38.2     |
| 2007no | 0.135    | 20.5 | Ia     | 02 41 05.70 | - 3 38 14.1 |
| 2007ov | 0.32     | 22.3 | Ia     | 02 41 08.76 | 0 08 40.0   |
| 2005lq | 0.369999 | 22.3 | Ia     | 02 41 36.04 | 0 12 18.1   |
| 2013ae | 0.028    | 16.2 | Ia     | 02 41 53.16 | 23 58.8     |
| 2005ft | 0.159997 | 20.5 | Ia     | 02 42 04.98 | - 0 32 26.9 |
| 2006hh | 0.239999 | 21.9 | Ia     | 02 42 26.97 | - 0 47 38.9 |

|        |          |       |       |             |             |
|--------|----------|-------|-------|-------------|-------------|
| 2007qq | 0.24     | 23    | Ia    | 02 42 30.21 | - 0 58 16.1 |
| 2012hh | 0.031185 | 16.7  | Ia    | 02 42 39.56 | 31 54.6     |
| 2004fd | 0.017323 | 15.7  | Ia    | 02 43 15.25 | 25 25.6     |
| 2007kl | 0.26     | 21.9  | Ia    | 02 44 50.90 | 0 21 53.4   |
| 2005mh | 0.39     | 22.4  | Ia:   | 02 44 56.68 | 0 12 12.9   |
| 2009I  | 0.026177 | 16.4  | Ia    | 02 45 10.40 | - 4 42 49.4 |
| 2002go | 0.235999 | 21.3  | Ia    | 02 45 43.16 | - 0 37 44.7 |
| 1995ak | 0.02272  | 16.2  | Ia    | 02 45 48.83 | 3 13 50.1   |
| 2006fj | 0.189998 | 20.3  | Ia    | 02 47 08.67 | 0 46 30.5   |
| 2007so | 0.02983  | 17    | Ia    | 02 47 43.13 | 15 14.8     |
| 2006gx | 0.179997 | 21.2  | Ia    | 02 48 14.08 | - 0 20 49.3 |
| 2007km | 0.25     | 21.1  | Ia    | 02 48 20.07 | - 0 17 17.3 |
| 2010kj | 0.064    | 18    | Ia    | 02 48 37.15 | 7 24 10.8   |
| 2011iq | 0.015    | 18.3  | Ia    | 02 48 49.60 | - 8 04 30.0 |
| 2003hm | 0.013915 | 17.7  | Ia    | 02 48 58.39 | 3 10 07.6   |
| 2010he | 0.028412 | 16.8  | Ia    | 02 49 10.80 | -14 26 59.8 |
| 2013I  | 0.035214 | 17.8  | Ia    | 02 49 42.17 | 0 45 35.7   |
| 2003iv | 0.034372 | 17.1  | Ia    | 02 50 07.25 | 50 46.5     |
| 2012gz | 0.03     | 17.2  | Ia    | 02 50 17.61 | 24 39.9     |
| 2007nh | 0.27     | 21.8  | Ia    | 02 50 27.69 | - 0 33 04.2 |
| 2005fu | 0.199998 | 20.6  | Ia    | 02 50 32.09 | 0 48 28.1   |
| 2005jt | 0.359999 | 23.1  | Ia    | 02 50 40.16 | - 0 03 57.5 |
| 2007he | 0.12     | 19.8  | Ia    | 02 51 40.17 | -12 39 31.5 |
| 2008ey | 0.018084 | 18.1  | Ia    | 02 51 42.39 | 49 51.5     |
| 2007nj | 0.15     | 21.9  | Ia    | 02 52 27.45 | 0 15 06.6   |
| 2007qr | 0.136027 | 20.5  | Ia    | 02 52 29.23 | - 1 08 22.3 |
| 2000dp | 0.034523 | 16.8  | Ia    | 02 52 44.41 | -14 31 54.7 |
| 2006nt | 0.28     | 22    | Ia    | 02 53 58.91 | 0 59 13.1   |
| 2010lp | 0.01014  | 16.7  | IaPec | 02 54 03.50 | 2 57 43.4   |
| 2005ls | 0.021136 | 15.8  | Ia    | 02 54 15.97 | 43 29.8     |
| 2006os | 0.03281  | 17.2  | Ia    | 02 55 01.01 | 00 34.8     |
| 2007jk | 0.18     | 21.9  | Ia    | 02 55 05.64 | - 0 08 50.8 |
| 2006pz | 0.33     | 22.7  | Ia    | 02 55 08.24 | 0 14 05.2   |
| 2012fx | 0.017652 | 16.7  | IaPec | 02 55 41.24 | -27 25 26.7 |
| 2004go | 0.02903  | 16.5  | Ia    | 02 55 41.76 | -14 14 14.5 |
| 2012fl | 0.086    | 19.2  | Ia    | 02 56 04.38 | 0 56 01.0   |
| 2006nk | 0.2      | 21.7  | Ia    | 02 56 16.61 | - 0 24 38.8 |
| 2009mm | 0.17     | 20.6  | Ia    | 02 56 23.61 | 40 31.6     |
| 2005et | 0.034377 | 17.9  | Ia    | 02 56 30.53 | 56 12.8     |
| 1994ah | 0.021664 | 18    | Ia    | 02 56 37.75 | -33 54 43.6 |
| 2011hh | 0.015    | 16.9  | Ia    | 02 57 04.61 | 47 43.3     |
| 1996bb | 0.56     | 23.6  | Ia:   | 02 57 06.06 | - 2 42 17.4 |
| 2008ih | 0.072    | 18.58 | Ia    | 02 57 26.41 | 58 07.6     |
| 1995ao | 0.240166 | 21.5  | Ia    | 02 57 30.70 | - 1 41 19.8 |
| 2011id | 0.0631   | 18    | Ia    | 02 57 40.49 | -51 02 28.1 |
| 2009iv | 0.0226   | 17.6  | Ia    | 02 58 14.19 | 5 58 19.3   |
| 2009hp | 0.021016 | 16.7  | Ia    | 02 58 23.96 | 6 35 35.1   |
| 2012I  | 0.029    | 16.2  | Ia    | 02 58 27.83 | 6 11 25.3   |
| 1998fc | 0.107    | 20.5  | Ia    | 02 59 12.61 | 3 29 39.0   |
| 2007jd | 0.072633 | 22.5  | Ia    | 02 59 53.37 | 1 09 38.6   |

|        |          |       |       |             |             |
|--------|----------|-------|-------|-------------|-------------|
| 2011el | 0.048    | 17.6  | Ia    | 03 00 18.20 | 5 49 24.9   |
| 2003kd | 0.030187 | 16.7  | Ia    | 03 00 45.80 | 27 13.0     |
| 2001dw | 0.02544  | 16.6  | Ia    | 03 00 47.88 | 46 27.5     |
| 2003ls | 0.0434   | 16.5  | Ia    | 03 01 00.39 | -10 53 04.5 |
| 2006qa | 0.4      | 23    | Ia    | 03 01 09.73 | - 0 01 34.5 |
| 2005gj | 0.059998 | 17.2  | IaPec | 03 01 11.95 | - 0 33 13.9 |
| 2005fb | 0.159997 | 20.6  | Ia    | 03 01 17.54 | - 0 38 38.6 |
| 2005do | 0.030471 | 17.4  | Ia    | 03 02 00.42 | 34 34.2     |
| 1993ab | 0.013931 | 18    | Ia:   | 03 02 01.45 | 34 53.5     |
| 2013hk | 0.017135 | 15.9  | Ia    | 03 02 10.85 | 55 38.8     |
| 2008fu | 0.052406 | 17.4  | Ia    | 03 02 28.50 | -24 27 21.5 |
| 1999fc | 0.649999 | 24.8  | Ia    | 03 02 30.41 | 0 10 14.0   |
| 2009km | 0.018346 | 15.6  | Ia    | 03 02 59.01 | -14 49 01.9 |
| 1999fd | 0.879998 | 25.3  | Ia:   | 03 03 17.49 | 0 03 06.6   |
| 2014dd | 0.023244 | 17.5  | Ia    | 03 03 36.18 | 56 52.0     |
| 2013fe | 0.02032  | 14.4  | Ia    | 03 03 53.27 | -39 24 20.3 |
| 2008R  | 0.013512 | 14.6  | Ia    | 03 03 53.72 | -11 59 39.3 |
| 2003hv | 0.005619 | 12.5  | Ia    | 03 04 09.32 | -26 05 07.5 |
| 2005ij | 0.109999 | 20.1  | Ia    | 03 04 21.26 | - 1 03 46.6 |
| 2010ly | 0.04     | 17.9  | Ia    | 03 05 03.56 | -19 40 38.8 |
| 1992bc | 0.020163 | 15.2  | Ia    | 03 05 17.28 | -39 33 39.7 |
| 2005fv | 0.118411 | 19.8  | Ia    | 03 05 22.43 | 0 51 30.1   |
| 2003V  | 0.044997 | 18.2  | Ia    | 03 05 43.05 | - 1 24 12.8 |
| 1994al | 0.42     | 22.6  | Ia    | 03 06 22.45 | 18 33.7     |
| 2007mg | 0.16     | 21.1  | Ia    | 03 06 33.83 | 0 47 35.9   |
| 2006np | 0.107344 | 21    | Ia    | 03 06 39.48 | 0 03 50.5   |
| 2007nt | 0.21     | 22.1  | Ia    | 03 06 43.80 | - 0 45 14.5 |
| 2004il | 0.107207 | 19.5  | Ia    | 03 07 02.69 | - 0 00 40.1 |
| 2005ez | 0.129999 | 20.3  | Ia:   | 03 07 10.97 | 1 07 10.3   |
| 1997ee | 0.166114 | 20.5  | Ia    | 03 07 24.82 | - 3 10 26.7 |
| 2006tc | 0.21     | 22.3  | Ia    | 03 08 01.96 | 0 56 36.4   |
| 2000fs | 0.02884  | 18.7  | Ia    | 03 08 26.24 | 4 06 39.9   |
| 2014de | 0.05     | 17.2  | Ia    | 03 08 31.86 | 25 30.2     |
| 2006qw | 0.03     | 17.9  | Ia    | 03 08 46.88 | 56 26.0     |
| 2005eq | 0.029026 | 17.2  | IaPec | 03 08 49.31 | - 7 01 59.7 |
| 2001kl | 0.126202 | 20.4  | Ia    | 03 08 51.44 | - 1 10 24.1 |
| 2007hd | 0.09     | 18.9  | Ia    | 03 08 56.43 | -11 16 22.6 |
| 2009bt | 0.014263 | 16.9  | Ia    | 03 08 56.99 | 33 35.1     |
| 2009aq | 0.031    | 16.8  | Ia    | 03 09 19.79 | 05 05.3     |
| 2013gv | 0.03412  | 17.76 | Ia    | 03 09 57.30 | 12 48.3     |
| 2008gy | 0.029    | 16.8  | Ia    | 03 10 00.95 | 13 23.1     |
| 2007pp | 0.26     | 22.2  | Ia    | 03 11 01.16 | 0 21 24.3   |
| 2007qs | 0.29     | 21.5  | Ia    | 03 11 46.03 | 0 05 30.9   |
| 2007nu | 0.28     | 21.8  | Ia    | 03 11 50.18 | - 0 41 32.7 |
| 1996bc | 0.460001 | 22.5  | Ia    | 03 12 06.58 | 0 38 17.1   |
| 2011ag | 0.032343 | 17.3  | Ia    | 03 12 26.55 | 15 06.4     |
| 1995ap | 0.300207 | 21.5  | Ia    | 03 12 28.13 | 0 41 43.4   |
| 1996au | 0.519999 | 22.5  | Ia    | 03 12 47.79 | 0 45 11.9   |
| 2006hw | 0.139996 | 22.5  | Ia    | 03 13 03.44 | - 0 28 17.9 |
| 2012eu | 0.029937 | 17.3  | Ia    | 03 13 04.16 | - 8 23 31.7 |

|        |          |       |       |             |             |
|--------|----------|-------|-------|-------------|-------------|
| 2007lm | 0.21     | 21.4  | Ia    | 03 13 40.44 | 0 37 47.9   |
| 2012ic | 0.040898 | 17.1  | Ia    | 03 13 53.71 | 58 03.7     |
| 2013hi | 0.025367 | 16.2  | Ia    | 03 14 24.72 | 10 49.1     |
| 2007mh | 0.13     | 19.9  | Ia    | 03 14 31.77 | 0 16 11.4   |
| 2007kh | 0.05     | 18.1  | Ia    | 03 15 12.10 | 10 13.0     |
| 2006ib | 0.179997 | 22.1  | Ia    | 03 16 11.83 | - 0 36 03.4 |
| 2007gn | 0.03     | 18.3  | Ia    | 03 16 31.37 | 27 40.7     |
| 2006dr | 0.015124 | 16.1  | Ia    | 03 17 14.19 | -32 34 31.8 |
| 2008L  | 0.019483 | 17.8  | Ia    | 03 17 16.65 | 22 57.6     |
| 2005hr | 0.119999 | 19.5  | Ia    | 03 18 33.83 | 0 07 24.1   |
| 2008fg | 0.010884 | 17    | Ia    | 03 18 44.10 | 28 57.2     |
| 2006P  | 0.015364 | 17.4  | Ia:   | 03 19 17.90 | -12 06 18.3 |
| 2006lb | 0.18     | 20.9  | Ia    | 03 19 28.19 | - 0 19 04.9 |
| 2005mz | 0.017678 | 18    | IaPec | 03 19 49.88 | 30 18.6     |
| 2003if | 0.00566  | 17.6  | Ia    | 03 19 52.61 | -26 03 50.5 |
| 2008fh | 0.01     | 17.1  | Ib:   | 03 20 18.62 | 21 44.5     |
| 2005fy | 0.199998 | 20.9  | Ia    | 03 20 21.70 | - 0 53 08.0 |
| 1991bc | 0.021351 | 16    | Ia    | 03 20 45.66 | - 1 02 47.2 |
| 2011fw | 0.016896 | 17.2  | Ia    | 03 20 54.21 | 52 05.0     |
| 2007nk | 0.22     | 21.5  | Ia    | 03 20 56.52 | 1 03 29.3   |
| 1998dz | 0.089998 | 18.5  | Ia    | 03 20 58.18 | -41 05 22.8 |
| 2011iz | 0.038    | 17.2  | Ia    | 03 21 36.48 | 33 46.1     |
| 2012Z  | 0.007127 | 15.6  | IaPec | 03 22 05.35 | -15 23 15.6 |
| 2002fk | 0.007127 | 13.1  | Ia    | 03 22 05.71 | -15 24 03.2 |
| 2006dd | 0.005922 | 14    | Ia    | 03 22 41.62 | -37 12 13.0 |
| 2006mr | 0.005922 | 15.14 | Ia    | 03 22 42.84 | -37 12 28.5 |
| 2008gp | 0.033523 | 18.1  | Ia    | 03 23 00.73 | 1 21 42.8   |
| 2007mi | 0.13     | 19.9  | Ia    | 03 23 31.52 | 0 40 00.0   |
| 2002es | 0.017992 | 16    | IaPec | 03 23 47.23 | 33 53.5     |
| 2006kj | 0.21     | 20.9  | Ia:   | 03 24 32.81 | 1 01 20.5   |
| 1994aa | 0.009059 | 17    | Ia    | 03 24 49.40 | - 3 02 33.6 |
| 2006mw | 0.12     | 22.1  | Ia:   | 03 25 08.47 | - 0 02 26.1 |
| 2007nz | 0.47     | 22.8  | Ia:   | 03 25 11.35 | - 0 06 22.5 |
| 2007ry | 0.048    | 17.9  | Ia    | 03 25 43.16 | 14 41.6     |
| 2010ka | 0.166    | 19.3  | Ia    | 03 26 01.99 | - 0 49 48.0 |
| 2013gp | 0.233872 | 21.6  | Ia    | 03 26 55.51 | -28 46 45.8 |
| 2008hm | 0.019664 | 17.2  | Ia    | 03 27 10.90 | 56 39.6     |
| 2006pg | 0.32     | 22.1  | Ia    | 03 27 20.71 | 1 05 22.8   |
| 2013go | 0.076    | 20.4  | IaPec | 03 27 44.64 | -28 29 13.6 |
| 2006qb | 0.33     | 22.3  | Ia    | 03 28 14.65 | - 0 12 03.5 |
| 2005jo | 0.229999 | 21.3  | Ia    | 03 28 21.68 | - 0 19 33.9 |
| 1997cu | 0.062289 | 18.2  | Ia    | 03 29 03.00 | -52 41 41.1 |
| 2005hs | 0.299997 | 21.8  | Ia    | 03 29 22.06 | - 1 05 40.9 |
| 2007qt | 0.31     | 22.7  | Ia    | 03 29 25.41 | - 0 38 46.7 |
| 1992bs | 0.063377 | 18.3  | Ia    | 03 29 27.20 | -37 16 18.9 |
| 2007py | 0.21     | 22.4  | Ia    | 03 29 31.60 | 0 30 56.0   |
| 2011gy | 0.016881 | 15.4  | Ia    | 03 29 35.30 | 52 03.3     |
| 2010ip | 0.052    | 17.6  | Ia    | 03 29 48.50 | 6 32 55.3   |
| 2006ta | 0.29     | 22    | Ia    | 03 29 50.42 | 0 17 42.3   |
| 2007jg | 0.037131 | 18.4  | Ia    | 03 29 50.82 | 0 03 24.6   |

|          |          |       |       |             |             |
|----------|----------|-------|-------|-------------|-------------|
| 2009ku   | 0.08     | 19.9  | IaPec | 03 29 53.23 | -28 05 12.2 |
| 2005if   | 0.067088 | 18.8  | Ia    | 03 30 12.87 | - 0 58 28.5 |
| 2007pz   | 0.13     | 20.9  | Ia    | 03 30 25.18 | 1 00 33.9   |
| 2005fw   | 0.159997 | 19.9  | Ia    | 03 30 49.04 | - 1 14 17.1 |
| 2001ip   | 0.54     | 23.8  | Ia    | 03 31 13.03 | -27 50 55.5 |
| 1993Y    | 0.020009 | 17.1  | Ia    | 03 31 24.41 | 45 02.6     |
| 2012gv   | 0.57     | 23.3  | Ia    | 03 31 37.09 | -27 21 18.1 |
| 2006lk   | 0.31     | 23.1  | Ia    | 03 32 04.60 | - 0 06 00.6 |
| 2002fx   | 1.4      | 26.41 | Ia    | 03 32 06.80 | -27 44 34.4 |
| HST04Mcg | 1.37     | 25.9  | Ia    | 03 32 10.02 | -27 49 50.0 |
| 1999gt   | 0.273999 | 22.1  | Ia    | 03 32 10.28 | -28 06 16.0 |
| HST04Rak | 0.74     | 24.1  | Ia    | 03 32 18.15 | -27 44 10.6 |
| HST04Gre | 1.14     | 25.1  | Ia    | 03 32 21.49 | -27 46 58.3 |
| 2002kd   | 0.735    | 24.86 | Ia    | 03 32 22.34 | -27 44 26.9 |
| 2002hr   | 0.526    | 24.07 | Ia    | 03 32 22.57 | -27 41 52.2 |
| 2002hp   | 1.305    | 25.8  | Ia    | 03 32 24.79 | -27 46 17.8 |
| HST04Omb | 0.975    | 24.7  | Ia    | 03 32 25.34 | -27 45 03.0 |
| 2012fq   | 0.67     | 22.6  | Ia    | 03 32 32.90 | -27 51 21.1 |
| 2002kc   | 0.216    | 23.06 | Ia    | 03 32 34.72 | -27 39 58.3 |
| HST04Kur | 0.359    | 24    | Ia    | 03 32 36.03 | -27 51 17.7 |
| 2002fw   | 1.3      | 25.63 | Ia    | 03 32 37.52 | -27 46 46.6 |
| 2003aj   | 1.307    | 26.62 | Ia    | 03 32 44.33 | -27 55 06.4 |
| HST05Zwi | 0.521    | 23    | Ia    | 03 32 45.65 | -27 44 24.3 |
| 2003ak   | 1.551    | 26.3  | Ia    | 03 32 46.90 | -27 54 49.3 |
| 2012gt   | 0.491    | 23.3  | Ia    | 03 33 08.76 | -28 05 04.2 |
| 2009im   | 0.013164 | 15.1  | Ia    | 03 33 22.08 | - 4 59 56.8 |
| 2012fr   | 0.005462 | 13.78 | Ia    | 03 33 36.23 | -36 07 35.4 |
| 2012gs   | 0.525    | 22.5  | Ia    | 03 33 38.18 | -27 20 20.8 |
| 2005jf   | 0.299997 | 21.8  | Ia:   | 03 33 40.76 | - 0 06 43.5 |
| 2005gq   | 0.369999 | 22.6  | Ia    | 03 33 48.97 | 0 42 33.6   |
| 2006hu   | 0.139996 | 22    | Ia    | 03 34 22.72 | - 1 07 23.5 |
| 2009ky   | 0.26     | 20.8  | Ia    | 03 34 28.80 | -27 54 30.3 |
| 2007mj   | 0.12     | 20.4  | Ia    | 03 34 44.44 | 0 21 19.9   |
| 2012fa   | 0.4      | 23.4  | IaPec | 03 34 59.02 | -27 51 55.4 |
| 2005ke   | 0.004879 | 16.3  | Ia    | 03 35 04.35 | -24 56 38.8 |
| 2012ez   | 0.348    | 23.2  | Ia    | 03 35 16.37 | -27 29 49.2 |
| 2013S    | 0.018576 | 15.9  | Ia    | 03 35 30.29 | 16 59.3     |
| 2007po   | 0.29     | 22.1  | Ia    | 03 35 32.23 | 0 42 12.1   |
| 2003in   | 0.021331 | 17.7  | Ia    | 03 35 33.31 | 5 03 52.7   |
| 2007jh   | 0.040769 | 19.2  | Ia    | 03 36 01.54 | 1 06 12.2   |
| 2010kf   | 0.040769 | 17.5  | Ia    | 03 36 03.53 | 1 06 04.0   |
| 1992A    | 0.006152 | 12.6  | Ia    | 03 36 27.43 | -34 57 31.5 |
| 2005gr   | 0.239999 | 21    | Ia    | 03 36 37.49 | 1 04 45.0   |
| 1992bp   | 0.079001 | 18.5  | Ia    | 03 36 37.95 | -18 21 13.7 |
| 2014H    | 0.015    | 16.3  | Ia    | 03 37 01.41 | 05 01.0     |
| 2011dx   | 0.013854 | 16.5  | IaPec | 03 37 05.61 | - 5 01 56.3 |
| 2006jq   | 0.13     | 22.7  | Ia    | 03 37 06.50 | 0 00 33.7   |
| 2010jd   | 0.039033 | 17.4  | Ia    | 03 37 22.20 | -33 02 39.7 |
| 1990Y    | 0.039033 | 17.7  | Ia    | 03 37 22.64 | -33 02 40.1 |
| 2010hk   | 0.032102 | 17.6  | Ia    | 03 37 52.61 | 4 56 52.2   |

|        |          |       |       |             |             |
|--------|----------|-------|-------|-------------|-------------|
| 2006rw | 0.08     | 19.4  | Ia    | 03 38 09.57 | 2 26 05.6   |
| 2009kw | 0.24     | 21.3  | Ia    | 03 38 23.39 | -28 15 11.8 |
| 2006pv | 0.21     | 21.4  | Ia    | 03 38 29.47 | - 0 40 32.1 |
| 2007on | 0.006338 | 14.9  | Ia    | 03 38 50.90 | -35 34 30.0 |
| 2011iv | 0.006338 | 12.4  | Ia    | 03 38 51.34 | -35 35 31.8 |
| 2005ew | 0.002998 | 15.1  | Ia    | 03 39 23.74 | 02 49.0     |
| 2007hy | 0.19     | 20.9  | Ia    | 03 39 42.33 | 1 05 32.2   |
| 2006jr | 0.18     | 22.5  | Ia    | 03 39 47.15 | 0 59 34.2   |
| 2007ln | 0.09     | 21.8  | Ia:   | 03 40 43.21 | 1 00 11.0   |
| 2010jf | 0.023949 | 17.7  | IaPec | 03 40 43.47 | 1 03 34.0   |
| 2013D  | 0.027119 | 17.5  | IaPec | 03 41 15.13 | 23 03.9     |
| 1991bj | 0.018132 | 18.8  | Ia    | 03 41 30.48 | - 4 39 49.6 |
| 2010ey | 0.004906 | 16.8  | Ia    | 03 41 31.50 | -19 54 00.4 |
| 2006kf | 0.021251 | 17.4  | Ia    | 03 41 50.48 | 8 09 25.0   |
| 2010it | 0.013754 | 15.9  | Ia    | 03 41 57.50 | - 4 42 21.1 |
| 2005gp | 0.129999 | 20.2  | Ia    | 03 41 59.29 | - 0 46 57.6 |
| 2006kx | 0.16     | 21.1  | Ia    | 03 42 14.67 | 0 28 41.8   |
| 2013gy | 0.014069 | 17.9  | Ia    | 03 42 16.88 | - 4 43 18.5 |
| 2007rk | 0.2      | 22.2  | Ia    | 03 42 17.43 | 1 03 47.3   |
| 2007kk | 0.041027 | 17.6  | Ia    | 03 42 23.26 | 14 30.4     |
| 2006es | 0.041027 | 17    | Ia    | 03 42 24.48 | 14 31.0     |
| 1992bk | 0.058413 | 18.1  | Ia    | 03 43 01.90 | -53 37 56.8 |
| 2007ia | 0.13099  | 20    | Ia    | 03 43 10.06 | 0 06 08.9   |
| 2001el | 0.003902 | 12.7  | Ia    | 03 44 30.59 | -44 38 23.6 |
| 2003lb | 0.018105 | 15.8  | Ia    | 03 45 05.67 | 45 39.3     |
| 2008hy | 0.008538 | 14.3  | Ia    | 03 45 08.45 | 39 55.5     |
| 2006tb | 0.3      | 22.3  | Ia    | 03 45 15.49 | - 0 07 42.8 |
| 2010jm | 0.022362 | 17.4  | Ia    | 03 46 03.55 | 42 15.5     |
| 2006rz | 0.03092  | 20    | Ia    | 03 46 06.78 | 0 23 23.1   |
| 2014dg | 0.004005 | 14.9  | Ia    | 03 48 19.88 | 07 54.2     |
| 2006pn | 0.13     | 21.6  | Ia    | 03 49 02.85 | - 0 31 58.0 |
| 2005mo | 0.28     | 22.2  | Ia    | 03 50 12.90 | - 0 14 24.8 |
| 2006ro | 0.11     | 19.8  | Ia    | 03 51 16.85 | 50 05.4     |
| 2012B  | 0.017341 | 16.4  | Ia    | 03 51 34.52 | 04 42.9     |
| 1990ac | 0.063377 | 18    | Ia    | 03 53 09.26 | -29 44 37.8 |
| 2010kk | 0.213    | 20.2  | Ia    | 03 53 23.23 | 9 54 33.3   |
| 1991bb | 0.026563 | 17.7  | Ia    | 03 53 37.51 | 06 19.3     |
| 2012hp | 0.019456 | 16    | Ia    | 03 54 17.37 | 30 38.7     |
| 2009D  | 0.025053 | 16.5  | Ia    | 03 54 22.83 | -19 10 54.2 |
| 2010ia | 0.017909 | 17.3  | Ia    | 03 56 56.20 | 8 30 45.1   |
| 2011ha | 0.094    | 18.5  | Ia    | 03 57 40.87 | 09 55.2     |
| 1996bx | 0.060001 | 18.3  | Ia    | 03 59 16.45 | -53 22 26.3 |
| 1991bd | 0.012731 | 17    | Ia    | 04 02 49.66 | 1 58 26.3   |
| 2010iv | 0.074    | 17.4  | Ia    | 04 03 52.23 | -43 25 38.5 |
| 2012en | 0.017295 | 17.8  | Ia    | 04 07 25.20 | 1 45 32.9   |
| 2003ay | 0.073    | 19.1  | Ia    | 04 07 26.25 | 07 55.4     |
| 2014dm | 0.033116 | 16.55 | Ia    | 04 08 07.13 | - 8 49 37.0 |
| 2008ge | 0.003502 | 12.4  | IaPec | 04 08 24.68 | -47 53 47.4 |
| 2007hg | 0.03     | 18    | Ia    | 04 08 32.65 | 2 22 43.7   |
| 2006ig | 0.039997 | 19.2  | Ia    | 04 10 21.09 | 28 24.4     |

|        |          |      |       |             |             |
|--------|----------|------|-------|-------------|-------------|
| 2005hh | 0.064998 | 19.3 | Ia    | 04 13 05.51 | -25 04 00.5 |
| 2011U  | 0.01335  | 16.6 | Ia    | 04 13 33.94 | 32 36.7     |
| 1999fn | 0.469998 | 23.5 | Ia    | 04 14 03.88 | 4 17 55.0   |
| 1999fo | 1.07     | 24   | Ia    | 04 14 45.75 | 6 38 34.3   |
| 2000eh | 0.489998 | 22.4 | Ia    | 04 15 02.44 | 4 23 18.1   |
| 2004ea | 0.006517 | 18.2 | Ia    | 04 16 13.20 | -16 45 20.5 |
| 2009ab | 0.011171 | 16.5 | Ia    | 04 16 36.39 | 2 45 51.0   |
| 2005df | 0.004319 | 12.5 | Ia    | 04 17 37.85 | -62 46 09.5 |
| 1997ej | 0.022302 | 16.5 | Ia    | 04 17 53.49 | -56 36 58.2 |
| 2014dn | 0.022302 | 17.1 | IaPec | 04 17 54.28 | -56 36 45.2 |
| 2010el | 0.005004 | 16.5 | IaPec | 04 19 58.83 | -54 56 38.5 |
| 2011gs | 0.027    | 17.4 | Ia    | 04 21 09.99 | 28 04.4     |
| 2013fh | 0.029803 | 17.8 | Ia    | 04 21 38.29 | -17 55 41.4 |
| 2009la | 0.020385 | 15.8 | Ia    | 04 22 45.81 | -40 36 49.3 |
| 2013fz | 0.020607 | 15.1 | Ia    | 04 23 46.44 | -51 35 46.3 |
| 2014cd | 0.020607 | 15.9 | Ia    | 04 23 47.24 | -51 36 02.9 |
| 2011do | 0.018392 | 14.8 | Ia    | 04 25 47.56 | -67 48 40.7 |
| 2001gi | 0.199998 | 21   | Ia    | 04 28 07.06 | -36 21 45.2 |
| 2001eb | 0.012652 | 16.3 | Ia    | 04 30 45.10 | 0 52 17.9   |
| 1997A  | 0.058473 | 18.5 | Ia    | 04 31 33.39 | -61 07 10.4 |
| 1998ea | 0.057456 | 19.5 | Ia    | 04 33 46.59 | -61 35 20.4 |
| 2012fu | 0.060502 | 17.5 | Ia    | 04 37 19.13 | -69 08 25.4 |
| 2006lf | 0.013208 | 17.6 | Ia    | 04 38 29.49 | 02 01.5     |
| 2008gw | 0.064    | 18.8 | Ia    | 04 39 26.21 | 9 08 31.6   |
| 2001fs | 0.840001 | 23.9 | Ia    | 04 39 30.68 | - 1 28 21.9 |
| 2010kg | 0.016646 | 17.7 | Ia    | 04 40 08.40 | 7 21 00.0   |
| 1999ep | 0.060001 | 18.9 | Ia    | 04 41 04.76 | - 3 00 39.6 |
| 2004B  | 0.01565  | 17.8 | Ia    | 04 42 04.72 | - 7 12 07.8 |
| 2011bx | 0.058    | 17.1 | Ia    | 04 42 12.57 | -48 44 12.6 |
| 2012id | 0.015748 | 16.3 | Ia    | 04 42 41.13 | 34 59.8     |
| 2003ah | 0.03     | 17   | Ia    | 04 43 08.54 | 0 46 00.4   |
| 1995bd | 0.015393 | 17.3 | IaPec | 04 45 21.24 | 04 02.5     |
| 2011jv | 0.082    | 18.6 | Ia    | 04 48 02.55 | - 4 08 22.6 |
| 2010ll | 0.066    | 18.1 | Ia    | 04 50 29.81 | -10 44 17.0 |
| 2009ic | 0.015347 | 14.8 | Ia    | 04 53 18.03 | - 3 00 59.6 |
| 2005ec | 0.029263 | 16.6 | Ia    | 04 54 19.17 | 1 38 27.6   |
| 1997F  | 0.580001 | 23.9 | Ia    | 04 55 14.27 | - 5 51 44.8 |
| 2004gb | 0.219998 | 20.5 | Ia    | 04 55 22.30 | -67 30 44.3 |
| 1997ek | 0.860001 | 23.8 | Ia    | 04 56 11.63 | - 3 41 26.0 |
| 1998eo | 0.840001 | 23.6 | Ia    | 04 56 15.47 | - 3 46 38.7 |
| 1997el | 0.639999 | 23.1 | Ia    | 04 56 41.21 | - 3 27 54.7 |
| 1997em | 0.460001 | 23.6 | Ia    | 04 56 50.44 | - 3 51 37.1 |
| 1997en | 0.769999 | 24.4 | Ia:   | 04 56 57.21 | - 4 11 46.0 |
| 1997ey | 0.580001 | 22.9 | Ia    | 04 56 58.19 | - 2 37 36.7 |
| 2001ep | 0.013012 | 15   | Ia    | 04 57 00.26 | - 4 45 40.2 |
| 1997ep | 0.460001 | 22.4 | Ia    | 04 57 48.59 | - 3 42 44.7 |
| 1997G  | 0.762997 | 23.7 | Ia    | 04 58 30.23 | - 3 16 04.0 |
| 1997eq | 0.54     | 22.5 | Ia    | 04 58 56.32 | - 3 59 29.4 |
| 2009F  | 0.013337 | 15.5 | Ia    | 04 59 23.56 | -11 07 50.1 |
| 1992bh | 0.045001 | 17.7 | Ia    | 04 59 27.55 | -58 49 44.2 |

|        |          |      |       |             |             |
|--------|----------|------|-------|-------------|-------------|
| 1997H  | 0.529999 | 22.8 | Ia    | 04 59 36.57 | - 3 09 34.6 |
| 1997I  | 0.180001 | 20.9 | Ia    | 04 59 37.31 | - 3 09 01.6 |
| 1997fc | 0.054037 | 20.5 | Ia    | 04 59 58.81 | -38 55 04.3 |
| 1997er | 0.469998 | 22.3 | Ia    | 05 00 38.56 | - 3 59 32.2 |
| 2010kt | 0.053    | 16.8 | Ia    | 05 00 39.19 | -38 40 46.1 |
| 2011M  | 0.017425 | 17.1 | Ia    | 05 00 41.55 | 14 38.6     |
| 2006le | 0.017425 | 17.6 | Ia    | 05 00 41.99 | 15 19.0     |
| 2012he | 0.055968 | 18.2 | Ia    | 05 00 50.07 | -38 39 11.4 |
| 2011hq | 0.025721 | 18.3 | Ia    | 05 00 56.13 | -13 24 57.9 |
| 1997fb | 0.053101 | 18.6 | Ia    | 05 01 14.60 | -38 38 12.7 |
| 2012hx | 0.028    | 16.3 | Ia    | 05 01 29.88 | -13 43 46.4 |
| 2011gl | 0.040444 | 17.7 | Ia    | 05 01 43.07 | -15 23 24.7 |
| 2006hb | 0.01527  | 15.7 | IaPec | 05 02 01.28 | -21 07 55.1 |
| 2009ad | 0.028387 | 16.6 | Ia    | 05 03 33.38 | 6 39 35.7   |
| 2006aw | 0.01617  | 14.9 | Ia    | 05 04 18.18 | -63 34 57.3 |
| 2011kk | 0.043113 | 17.4 | Ia    | 05 07 37.90 | 7 15 24.6   |
| 1993af | 0.003345 | 17   | Ia:   | 05 08 00.71 | -37 29 18.0 |
| 2004gw | 0.01701  | 17.9 | Ia    | 05 08 48.41 | 26 20.7     |
| 2011kj | 0.038894 | 16.7 | Ia    | 05 11 21.23 | -25 53 05.9 |
| 2003F  | 0.017271 | 15.9 | Ia    | 05 11 33.01 | 03 28.4     |
| 2014aj | 0.020395 | 17.6 | Ia    | 05 11 43.91 | 29 29.1     |
| 2005el | 0.01493  | 16   | Ia    | 05 11 48.72 | 5 11 39.4   |
| 2011ka | 0.016408 | 14.5 | Ia    | 05 14 28.23 | -62 10 19.3 |
| 2011jq | 0.032604 | 18.4 | IaPec | 05 16 41.55 | 6 29 30.2   |
| 2012H  | 0.031852 | 16.5 | Ia    | 05 20 14.94 | -25 18 56.4 |
| 2004gc | 0.032088 | 17.4 | Ia    | 05 21 49.95 | 6 40 33.7   |
| 2010fy | 0.049    | 17.1 | Ia    | 05 24 52.46 | -46 46 37.1 |
| 1998Z  | 0.03858  | 19.6 | Ia    | 05 24 58.78 | -31 21 38.1 |
| 2013ex | 0.01043  | 15.6 | Ia    | 05 32 46.62 | -14 02 45.4 |
| 2010ko | 0.01043  | 16.8 | Ia    | 05 32 49.44 | -14 05 45.9 |
| 2004N  | 0.050001 | 17.9 | Ia    | 05 35 20.37 | -69 27 18.3 |
| 1999J  | 0.033299 | 17   | IaPec | 05 35 32.27 | -69 29 52.1 |
| 1999ek | 0.017522 | 17.9 | Ia    | 05 36 31.60 | 38 17.8     |
| 2013az | 0.037332 | 17.1 | Ia    | 05 39 52.13 | -40 30 28.1 |
| 2009jz | 0.023959 | 17   | IaPec | 05 40 05.29 | -55 32 04.0 |
| 2002B  | 0.142998 | 20.5 | Ia    | 05 40 46.06 | -71 51 15.1 |
| 2010ju | 0.015244 | 16.7 | Ia    | 05 41 55.99 | 29 51.0     |
| 1998eb | 0.013119 | 17.8 | Ia    | 05 42 12.02 | 22 26.3     |
| 2014I  | 0.03012  | 17   | Ia    | 05 42 19.80 | -25 32 39.9 |
| 1993ac | 0.049    | 18.4 | Ia:   | 05 46 23.60 | 22 07.0     |
| 2004J  | 0.025    | 17.5 | Ia    | 05 46 32.18 | -17 46 53.0 |
| 2003hx | 0.007098 | 14.3 | Ia    | 05 46 46.97 | -16 47 00.6 |
| 2003hz | 0.020173 | 16.7 | Ia    | 05 48 07.86 | 15 22.8     |
| 1997eh | 0.045127 | 18.5 | Ia    | 05 49 04.59 | -24 29 01.6 |
| 2006ke | 0.017181 | 18.3 | Ia    | 05 52 37.38 | 49 00.5     |
| 2011ah | 0.027198 | 16   | Ia    | 05 53 50.77 | -32 44 44.2 |
| 2009J  | 0.015783 | 17.4 | IaPec | 05 55 21.13 | -76 55 20.8 |
| 2009iw | 0.015783 | 14.6 | Ia    | 05 55 25.63 | -76 55 15.9 |
| 2001gc | 0.01929  | 15.5 | Ia    | 05 55 26.14 | 54 34.2     |
| 2003ij | 0.018382 | 17.8 | Ia    | 05 55 41.18 | 54 21.7     |

|        |          |      |    |             |             |
|--------|----------|------|----|-------------|-------------|
| 2006nr | 0.018382 | 15.8 | Ia | 05 56 23.51 | 54 38.8     |
| 1996by | 0.013722 | 16.1 | Ia | 05 58 24.96 | 27 12.1     |
| 2012fd | 0.018898 | 15.2 | Ia | 05 58 51.93 | -23 20 24.2 |

Table A2. Plot 2 Data from The SAI Supernova Catalog.

| sn_name | redshift | sn_mag | sn_type | sn_ra       | sn_dec      |
|---------|----------|--------|---------|-------------|-------------|
| 2002fc  | 0.879998 | 24.2   | Ia      | 14 00 23.29 | 5 45 41.9   |
| 2007dv  | 0.1      | 19     | Ia      | 14 00 51.02 | 57 28.4     |
| 2012T   | 0.026378 | 17.4   | IaPec   | 14 01 41.69 | 49 33.9     |
| 2011is  | 0.020869 | 16.6   | Ia      | 14 01 47.00 | 9 29 50.8   |
| 2001gm  | 0.478    | 23.4   | Ia      | 14 01 51.18 | 5 05 38.5   |
| 2001gq  | 0.671    | 23.9   | Ia      | 14 01 51.38 | 4 53 12.4   |
| 2002fl  | 0.259999 | 21.9   | Ia      | 14 01 52.33 | 4 39 23.2   |
| 2000fr  | 0.542998 | 24.5   | Ia      | 14 01 57.75 | 4 43 42.4   |
| 2001gn  | 1.1      | 25     | Ia      | 14 01 59.90 | 5 04 59.6   |
| 2001go  | 0.551998 | 23.7   | Ia      | 14 02 00.95 | 5 00 59.2   |
| 2002am  | 0.03002  | 19.1   | Ia      | 14 02 03.14 | -10 35 23.9 |
| 1998D   | 0.012309 | 15.5   | Ia      | 14 02 59.28 | 44 54.3     |
| 2011fe  | 0.000796 | 10.1   | Ia      | 14 03 05.81 | 16 25.4     |
| 1991B   | 0.008713 | 16     | Ia      | 14 03 24.29 | - 6 04 22.9 |
| 2009mz  | 0.008713 | 14.7   | Ia      | 14 03 24.64 | - 6 03 31.3 |
| 2002ff  | 1.1      | 24     | Ia:     | 14 03 39.82 | 5 46 50.6   |
| 2002fd  | 0.277998 | 23.4   | Ia      | 14 03 54.08 | 4 59 49.0   |
| 1999ax  | 0.050001 | 18.5   | Ia:     | 14 03 57.92 | 51 09.2     |
| 2002fe  | 1.086    | 24.7   | Ia      | 14 04 18.16 | 5 19 25.6   |
| 2001U   | 0.028422 | 17.3   | Ia      | 14 04 42.94 | - 9 42 29.7 |
| 2011bz  | 0.028422 | 17.4   | Ia      | 14 04 43.75 | - 9 43 04.7 |
| 1999cp  | 0.009485 | 14.2   | Ia      | 14 06 31.30 | - 5 26 49.0 |
| 2002cr  | 0.009485 | 14.2   | Ia      | 14 06 37.59 | - 5 26 21.9 |
| 1995P   | 0.056006 | 18     | Ia:     | 14 07 14.33 | - 2 43 32.7 |
| 2010fd  | 0.53     | 22.4   | Ia      | 14 07 14.93 | 59 51.5     |
| 1997ct  | 0.03     | 18.6   | Ia      | 14 07 26.88 | 26 05.9     |
| 2008cf  | 0.046031 | 16.8   | Ia      | 14 07 32.56 | -26 33 06.6 |
| 2012di  | 0.07     | 18.1   | Ia      | 14 08 06.69 | 03 07.7     |
| 2005S   | 0.019813 | 19.1   | Ia      | 14 08 28.84 | 7 03 27.2   |
| 2007cc  | 0.029083 | 15.8   | Ia      | 14 08 41.98 | -21 35 48.4 |
| 1999ck  | 0.431998 | 21.9   | Ia      | 14 08 56.59 | - 0 05 50.7 |
| 2009ey  | 0.179    | 20.6   | Ia      | 14 09 16.68 | 06 12.8     |
| 2010ff  | 0.27     | 22.9   | Ia      | 14 09 19.94 | 15 45.2     |
| 1997cn  | 0.016766 | 16.2   | IaPec   | 14 09 57.76 | 32 32.3     |
| 2007ei  | 0.1      | 20.1   | Ia      | 14 10 11.29 | 8 18 39.8   |
| 2001ko  | 0.14057  | 20     | Ia      | 14 10 58.32 | 50 50.9     |
| 2009nk  | 0.019639 | 17     | Ia      | 14 10 58.74 | 6 21 47.9   |
| 2004dl  | 0.249999 | 21.2   | Ia      | 14 11 11.50 | -12 02 36.9 |
| 1990M   | 0.008652 | 12.4   | Ia      | 14 11 29.30 | - 5 02 36.0 |
| 2010fr  | 0.45     | 22.3   | Ia      | 14 11 57.76 | 04 18.6     |
| 2010bp  | 0.009663 | 15.2   | Ia      | 14 12 07.89 | -49 23 43.3 |
| 2010fa  | 0.373    | 21.9   | Ia      | 14 13 01.87 | 27 46.6     |
| 2012dm  | 0.077906 | 19.5   | Ia      | 14 13 46.13 | 13 17.3     |

|        |          |       |       |             |             |
|--------|----------|-------|-------|-------------|-------------|
| 2010fs | 0.441    | 22.3  | Ia    | 14 14 03.34 | 21 43.8     |
| 2000bz | 0.259999 | 21.2  | Ia    | 14 15 02.66 | - 6 17 16.0 |
| 2009cs | 0.17     | 19.7  | Ia    | 14 15 19.36 | 25 14.0     |
| 2009gf | 0.018517 | 16.1  | Ia    | 14 15 37.11 | 16 48.6     |
| 2003fg | 0.239999 | 20.4  | Ia    | 14 16 18.78 | 14 55.4     |
| 2007fd | 0.07     | 19.5  | Ia    | 14 16 19.03 | 13 01.3     |
| 2003fn | 0.29     | 21.5  | Ia    | 14 16 33.44 | 20 32.1     |
| 1997ca | 0.519999 | 22.6  | Ia    | 14 16 40.24 | 31 59.2     |
| 2007ao | 0.023734 | 17.7  | IaPec | 14 16 49.74 | 48 24.1     |
| 2010fh | 0.387    | 22.3  | Ia    | 14 17 18.59 | 58 41.9     |
| 2003fo | 0.369999 | 22.4  | Ia    | 14 17 58.43 | 28 57.5     |
| 1996aa | 0.010842 | 17    | Ia    | 14 18 25.16 | 29 41.9     |
| 2013gn | 0.010842 | 15.5  | Ia    | 14 18 28.54 | 30 24.2     |
| 2003fi | 0.440001 | 22.4  | Ia    | 14 18 39.96 | 36 44.1     |
| 2003fj | 0.469998 | 22.2  | Ia    | 14 19 45.19 | 32 25.7     |
| 2003fk | 0.349998 | 22.3  | Ia    | 14 19 55.84 | 05 50.9     |
| 2003ey | 0.065001 | 18.8  | Ia    | 14 20 03.28 | - 8 28 40.0 |
| 2004aj | 0.247    | 22.3  | Ia    | 14 20 37.58 | -12 24 14.4 |
| 1996ah | 0.047386 | 18    | Ia    | 14 20 38.90 | 07 21.0     |
| 2003fp | 0.450001 | 22.6  | Ia    | 14 20 53.61 | 36 20.7     |
| 1999bo | 0.129999 | 19.7  | Ia    | 14 21 07.48 | - 5 57 25.8 |
| 2008cq | 0.00421  | 14.4  | Ia    | 14 21 09.61 | -29 15 04.0 |
| 2003ff | 0.499999 | 23.3  | Ia    | 14 21 14.92 | 32 15.3     |
| 2013bt | 0.036445 | 16.8  | Ia    | 14 21 15.12 | 34 15.5     |
| 2003fh | 0.249999 | 22.2  | Ia    | 14 21 35.89 | 31 37.7     |
| 2006dy | 0.007683 | 16.5  | Ia    | 14 22 11.50 | 55 14.0     |
| 2007af | 0.005471 | 15.3  | Ia    | 14 22 21.03 | - 0 23 37.6 |
| 2004K  | 0.03613  | 17.1  | Ia    | 14 23 39.85 | -19 26 50.0 |
| 2009av | 0.0555   | 18.62 | Ia    | 14 23 55.82 | 11 05.2     |
| 2012ei | 0.006417 | 14.7  | Ia    | 14 24 05.76 | 02 56.5     |
| 2009ft | 0.056835 | 17.9  | Ia    | 14 24 06.03 | 7 46 10.3   |
| 2005bv | 0.035654 | 16.5  | Ia    | 14 24 07.44 | 17 50.3     |
| 2002bz | 0.036992 | 16.9  | Ia    | 14 24 40.52 | 37 34.7     |
| 2001ay | 0.030242 | 16.7  | Ia    | 14 26 17.00 | 14 55.8     |
| 2014by | 0.024794 | 16    | Ia    | 14 27 48.59 | 33 42.5     |
| 1991ai | 0.052803 | 18.5  | Ia    | 14 27 55.19 | 12 20.5     |
| 2010V  | 0.01279  | 14.3  | Ia    | 14 28 38.46 | 38 09.5     |
| 2011ai | 0.035181 | 16.6  | Ia    | 14 29 05.03 | 54 42.4     |
| 2009bi | 0.126    | 20    | Ia    | 14 29 39.61 | 09 32.8     |
| 2000fw | 0.096249 | 19.1  | Ia    | 14 30 14.07 | 0 30 35.4   |
| 2009ce | 0.095    | 19.8  | Ia    | 14 31 01.13 | 46 57.9     |
| 2009ei | 0.23     | 20.9  | Ia    | 14 32 17.26 | 36 15.8     |
| 2013aa | 0.004007 | 11.9  | Ia    | 14 32 33.88 | -44 13 27.8 |
| 2011cv | 0.111587 | 19.2  | Ia    | 14 33 37.37 | -12 02 20.9 |
| 2006bw | 0.03     | 16.6  | Ia    | 14 33 56.73 | 3 47 55.8   |
| 2003du | 0.006396 | 13.5  | Ia    | 14 34 35.80 | 20 03.8     |
| 2002db | 0.036488 | 16    | Ia    | 14 34 51.63 | 39 52.9     |
| 2006dt | 0.026468 | 16.8  | Ia    | 14 35 43.11 | 8 17 55.8   |
| 2012N  | 0.035209 | 16    | Ia    | 14 35 44.65 | 43 41.6     |
| 2014bg | 0.035209 | 16.3  | Ia    | 14 35 45.97 | 43 18.2     |

|        |          |      |       |             |             |
|--------|----------|------|-------|-------------|-------------|
| 2005bc | 0.012266 | 16.4 | Ia    | 14 37 15.05 | 27 23.1     |
| 2001ck | 0.034697 | 16.4 | Ia    | 14 37 50.08 | 29 02.2     |
| 2007cw | 0.1      | 19.1 | Ia    | 14 38 07.48 | - 8 35 55.7 |
| 2002jo | 0.009172 | 16.3 | Ia    | 14 38 16.42 | 27 14.0     |
| 2012ci | 0.030611 | 17.5 | Ia    | 14 38 23.48 | 20 55.1     |
| 2010ax | 0.050792 | 17   | Ia    | 14 41 53.42 | 45 01.4     |
| 2009Y  | 0.009294 | 14.9 | Ia    | 14 42 24.55 | -17 14 46.3 |
| 2010cy | 0.0389   | 17   | Ia    | 14 43 42.85 | 3 58 16.2   |
| 2002lh | 0.235999 | 21   | Ia    | 14 44 20.38 | 15 44.4     |
| 2009en | 0.046711 | 17.6 | Ia    | 14 46 22.62 | 01 27.0     |
| 2009gb | 0.022572 | 14.9 | Ia    | 14 47 25.83 | -30 39 02.5 |
| 2009as | 0.022572 | 16.7 | Ia    | 14 47 26.64 | -30 39 34.5 |
| 2007gc | 0.12     | 19.3 | Ia    | 14 47 47.32 | 28 14.5     |
| 2007ee | 0.045748 | 19.4 | Ia    | 14 47 47.34 | 49 53.1     |
| 2010cs | 0.041888 | 19.6 | Ia    | 14 47 55.78 | 03 17.7     |
| 2006cz | 0.042007 | 17.3 | IaPec | 14 48 36.66 | - 4 44 30.7 |
| 2003jb | 0.041075 | 16.5 | Ia    | 14 49 22.28 | 16 06.2     |
| 2009fb | 0.08     | 19.1 | Ia    | 14 50 00.12 | 55 05.8     |
| 2014cb | 0.033183 | 16.4 | Ia    | 14 50 49.90 | -13 31 03.7 |
| 2007at | 0.05412  | 17.7 | Ia    | 14 51 12.28 | -21 23 31.2 |
| 2014an | 0.060608 | 18.6 | Ia    | 14 51 42.93 | 8 34 12.5   |
| 2011jt | 0.027777 | 16.5 | Ia    | 14 53 23.01 | 2 57 43.1   |
| 2009eg | 0.057    | 17.6 | Ia    | 14 54 15.47 | 57 52.8     |
| 2009hv | 0.054    | 18.6 | Ia    | 14 54 32.90 | 39 39.5     |
| 2007O  | 0.036083 | 16.8 | Ia    | 14 56 05.18 | 24 16.9     |
| 2008dk | 0.07     | 18.8 | Ia    | 14 56 13.33 | 51 14.1     |
| 2012M  | 0.033266 | 16.9 | Ia    | 14 56 59.85 | 35 59.6     |
| 2011cy | 0.16     | 20   | Ia    | 14 58 37.10 | 2 20 59.1   |
| 2013hr | 0.026191 | 16.2 | Ia    | 14 59 00.81 | 48 47.5     |
| 2008af | 0.033366 | 17.1 | Ia    | 14 59 28.50 | 39 12.3     |
| 2005be | 0.034997 | 16.1 | Ia    | 14 59 32.72 | 40 11.6     |
| 2002bg | 0.042452 | 16.9 | Ia    | 14 59 39.23 | 12 44.5     |
| 2012af | 0.053    | 16.7 | IaPec | 15 00 30.87 | 55 45.1     |
| 2009dy | 0.089    | 18.4 | Ia    | 15 01 04.03 | 13 13.9     |
| 2013bh | 0.074458 | 18.5 | IaPec | 15 02 13.09 | 38 45.6     |
| 2007dm | 0.08     | 19.6 | Ia    | 15 02 55.12 | 7 12 05.6   |
| 2004bw | 0.021198 | 17.6 | Ia    | 15 03 46.75 | - 3 18 16.4 |
| 2006bk | 0.049519 | 16.9 | Ia    | 15 04 33.65 | 57 51.1     |
| 2014ac | 0.028935 | 16.6 | Ia    | 15 04 40.09 | 37 54.2     |
| 2011ct | 0.11     | 19.1 | Ia    | 15 06 34.40 | -10 19 36.5 |
| 2009ej | 0.083    | 19   | Ia    | 15 10 59.53 | 6 33 10.0   |
| 2013eb | 0.018779 | 17.1 | Ia    | 15 11 14.80 | 09 11.1     |
| 1999cm | 0.045114 | 17.1 | Ia    | 15 11 19.18 | 07 11.4     |
| 1999dg | 0.021928 | 15.8 | Ia    | 15 11 28.41 | 29 05.7     |
| 2009ai | 0.040164 | 17.6 | Ia    | 15 11 35.92 | 5 23 47.5   |
| 2007ey | 0.11     | 19.7 | Ia    | 15 12 21.36 | 30 03.7     |
| 2012bf | 0.07     | 18.2 | Ia    | 15 13 41.81 | 06 06.6     |
| 2014M  | 0.0222   | 16.3 | Ia    | 15 15 17.18 | 29 09.7     |
| 2007ba | 0.038539 | 18.2 | Ia    | 15 16 42.63 | 7 23 47.8   |
| 2012ao | 0.065    | 19.8 | Ia    | 15 16 42.88 | -14 38 38.1 |

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|--------|----------|-------|-------|-------------|-------------|
| 2002ec | 0.040394 | 17.5  | Ia    | 15 19 24.89 | 53 14.0     |
| 2008dl | 0.31     | 21.6  | Ia    | 15 19 30.37 | 53 56.8     |
| 2009ek | 0.21     | 20.7  | Ia    | 15 19 46.76 | 31 50.6     |
| 2009eh | 0.044    | 21.2  | Ia    | 15 20 38.08 | 7 39 32.5   |
| 2005bm | 0.102997 | 19.5  | Ia    | 15 20 45.10 | 48 42.5     |
| 1996ab | 0.13009  | 19.7  | Ia    | 15 21 08.35 | 55 36.8     |
| 2005cf | 0.006461 | 15.5  | Ia    | 15 21 32.21 | - 7 24 47.5 |
| 2009gw | 0.11     | 20.7  | Ia    | 15 22 13.62 | 58 01.3     |
| 2009hb | 0.2      | 20.7  | Ia    | 15 22 29.65 | 04 48.4     |
| 2010dw | 0.03812  | 17.1  | Ia    | 15 22 40.31 | - 5 55 15.9 |
| 2008ck | 0.065    | 19.3  | Ia    | 15 22 42.30 | 22 08.0     |
| 2007dn | 0.07     | 18.9  | Ia    | 15 22 45.80 | 13 20.2     |
| 2012bs | 0.066    | 18.1  | Ia    | 15 23 01.70 | 7 11 41.2   |
| 2007ek | 0.08     | 18.7  | Ia    | 15 23 04.86 | 8 46 55.7   |
| 2001cw | 0.930643 | 24.3  | Ia    | 15 23 06.31 | 39 31.9     |
| 2007cf | 0.032836 | 17.9  | Ia    | 15 23 07.66 | 8 31 45.5   |
| 2014am | 0.053    | 17.4  | Ia    | 15 23 18.48 | 17 33.3     |
| 2003hj | 0.075919 | 17.5  | Ia    | 15 24 20.51 | 57 11.9     |
| 2013ck | 0.049    | 17.5  | Ia    | 15 24 29.07 | 32 54.6     |
| 2009fc | 0.081256 | 19.4  | Ia    | 15 27 48.59 | 35 34.1     |
| 2007bk | 0.032188 | 16.65 | Ia    | 15 28 45.58 | 52 12.8     |
| 2009fd | 0.139    | 20.4  | Ia    | 15 29 10.96 | 47 38.8     |
| 2007gd | 0.13     | 19.9  | Ia    | 15 29 31.48 | 7 59 51.1   |
| 2013dh | 0.013382 | 16.5  | IaPec | 15 30 01.09 | 59 12.9     |
| 2011et | 0.09     | 18.8  | Ia    | 15 30 01.40 | 52 29.1     |
| 1996cm | 0.450001 | 22.7  | Ia    | 15 30 11.25 | 5 55 27.0   |
| 2004cq | 0.021998 | 17.5  | Ia    | 15 31 19.76 | 16 52.1     |
| 2003K  | 0.021817 | 15.4  | Ia    | 15 32 01.91 | 14 35.9     |
| 2011bw | 0.089    | 19.2  | Ia    | 15 35 58.75 | 18 42.8     |
| 2013dd | 0.05205  | 17.5  | Ia    | 15 36 05.15 | 57 06.9     |
| 1990L  | 0.014436 | 18    | Ia    | 15 36 29.15 | 29 59.5     |
| 2014bp | 0.068    | 17.9  | Ia    | 15 36 31.24 | 54 14.2     |
| 2002gk | 0.209998 | 21.3  | Ia    | 15 37 07.50 | 9 36 19.0   |
| 2012dc | 0.089902 | 18.6  | Ia    | 15 38 17.95 | 44 17.3     |
| 2010gb | 0.022595 | 15.8  | Ia    | 15 38 39.79 | 00 19.9     |
| 2012el | 0.018175 | 16.4  | Ia    | 15 39 57.23 | -30 33 18.8 |
| 2009Q  | 0.025604 | 16.1  | Ia    | 15 40 12.88 | 44 18.1     |
| 2004cp | 0.053997 | 19.6  | Ia    | 15 40 24.76 | 51 57.2     |
| 2010bu | 0.039    | 16.9  | Ia    | 15 42 58.38 | 2 16 52.6   |
| 2002gl | 0.510996 | 23.3  | Ia    | 15 43 24.40 | 7 53 58.0   |
| 2001bs | 0.029186 | 18.2  | Ia    | 15 43 39.38 | 45 31.3     |
| 2004ct | 0.033373 | 17.5  | Ia    | 15 43 45.75 | 24 59.5     |
| 2001gw | 0.363001 | 22    | Ia    | 15 43 45.86 | 7 57 50.3   |
| 2011de | 0.029186 | 16.1  | Ia    | 15 43 53.25 | 45 42.5     |
| 2007fi | 0.12     | 19.7  | Ia    | 15 44 16.87 | 43 13.7     |
| 2009fh | 0.123    | 20.4  | Ia    | 15 44 38.77 | 47 51.2     |
| 2001al | 0.069998 | 21.1  | Ia    | 15 44 51.74 | 07 29.0     |
| 2001hd | 0.511    | 22.8  | Ia    | 15 45 35.92 | 8 16 50.6   |
| 2001he | 0.581999 | 23    | Ia:   | 15 46 35.69 | 8 11 26.4   |
| 2002gm | 0.489998 | 22.3  | Ia    | 15 46 57.00 | 8 12 37.0   |

|        |          |      |       |             |             |
|--------|----------|------|-------|-------------|-------------|
| 2002ck | 0.029882 | 15.9 | Ia    | 15 47 00.75 | - 0 59 25.5 |
| 2011ex | 0.04     | 17.6 | Ia    | 15 48 51.75 | 57 48.9     |
| 2011er | 0.12     | 18.9 | Ia    | 15 49 50.65 | 49 30.1     |
| 2009dc | 0.021391 | 15.6 | IaPec | 15 51 12.11 | 42 28.2     |
| 2000cf | 0.036001 | 17   | Ia    | 15 52 56.19 | 56 12.7     |
| 2005dh | 0.038359 | 16.9 | Ia    | 15 54 03.32 | 08 09.9     |
| 2008cg | 0.036168 | 16.6 | IIIn  | 15 54 15.15 | 58 25.0     |
| 2009ji | 0.048    | 17.9 | Ia    | 15 54 52.48 | 05 05.6     |
| 2009ih | 0.032882 | 17.3 | IaPec | 15 55 31.05 | 56 54.0     |
| 2004di | 0.019767 | 16.8 | Ia    | 15 55 41.00 | 51 49.0     |
| 2007ap | 0.015444 | 15.5 | Ia    | 15 56 23.06 | 30 57.9     |
| 2006bt | 0.032155 | 17.4 | Ia    | 15 56 30.53 | 02 45.6     |
| 2014ch | 0.044    | 16.5 | Ia    | 15 58 31.07 | 51 58.7     |
| 1991M  | 0.007236 | 14.4 | Ia    | 15 58 34.82 | 27 28.7     |
| 2002li | 0.326999 | 20.5 | Ia    | 15 59 03.08 | 18 16.0     |
| 2006ay | 0.09     | 19   | Ia    | 15 59 12.76 | 44 27.9     |
| 2010ft | 0.42     | 21.8 | Ia    | 16 01 15.41 | 17 53.5     |
| 2003ar | 0.025214 | 16.8 | Ia    | 16 02 08.11 | 24 55.5     |
| 2001bp | 0.094999 | 17.5 | Ia    | 16 02 09.25 | 43 08.0     |
| 1999cc | 0.031328 | 16.1 | Ia    | 16 02 42.03 | 21 34.4     |
| 2000Q  | 0.02     | 16   | Ia    | 16 05 11.85 | 39 51.5     |
| 2001cq | 0.199998 | 22.8 | Ia:   | 16 05 18.70 | 11 42.1     |
| 2000cp | 0.034223 | 18   | Ia    | 16 05 27.62 | 49 48.8     |
| 2008ek | 0.034537 | 18.9 | Ia    | 16 05 33.17 | 35 33.2     |
| 2010fi | 0.331    | 22.1 | Ia    | 16 05 44.83 | 04 27.9     |
| 2008ba | 0.03     | 18.6 | Ia    | 16 05 49.17 | 27 17.2     |
| 2009df | 0.12     | 18.6 | Ia    | 16 05 52.67 | 24 45.5     |
| 1996O  | 0.037245 | 18   | Ia    | 16 06 00.00 | 11 48.0     |
| 2004cv | 0.037125 | 16.6 | Ia    | 16 06 14.45 | 24 54.0     |
| 2010fj | 0.55     | 23.1 | Ia    | 16 06 48.80 | 58 51.4     |
| 2002lk | 0.119999 | 18.1 | Ia    | 16 06 55.92 | 28 18.2     |
| 1999ac | 0.009497 | 14.2 | IaPec | 16 07 15.01 | 7 58 20.4   |
| 2014bq | 0.08     | 17.8 | Ia    | 16 07 25.38 | 47 35.7     |
| 2010fb | 0.336    | 22.2 | Ia    | 16 08 18.40 | 54 29.2     |
| 2010fe | 0.43     | 22.4 | Ia    | 16 08 52.65 | 00 17.4     |
| 2014be | 0.071    | 18.6 | Ia    | 16 09 35.20 | 26 31.1     |
| 2006cc | 0.032612 | 18.1 | Ia    | 16 09 56.47 | 07 35.9     |
| 2010dy | 0.042619 | 17.6 | Ia    | 16 10 11.03 | 0 45 07.5   |
| 1992bi | 0.458    | 22   | Ia    | 16 10 12.81 | 47 12.7     |
| 2008cl | 0.063434 | 17.7 | Ia    | 16 11 04.35 | 27 08.0     |
| 2003au | 0.030791 | 19.2 | Ia    | 16 11 11.56 | 15 58.2     |
| 2011dv | 0.031103 | 16   | Ia    | 16 12 04.62 | 12 33.2     |
| 2011dz | 0.024598 | 16.4 | Ia    | 16 12 44.82 | 17 03.2     |
| 2007ai | 0.031661 | 17.3 | Ia    | 16 12 53.74 | -21 37 48.7 |
| 2010fl | 0.36     | 21.5 | Ia    | 16 13 48.22 | 36 30.7     |
| 2007ds | 0.14     | 19.7 | Ia    | 16 14 04.60 | 8 55 20.0   |
| 2000df | 0.039435 | 17.2 | Ia    | 16 14 12.22 | 6 09 00.6   |
| 2007di | 0.13     | 19.7 | Ia    | 16 14 25.92 | 5 09 21.1   |
| 2010fc | 0.233    | 22.5 | Ia    | 16 14 28.71 | 43 33.0     |
| 2002ci | 0.022228 | 17.1 | Ia    | 16 15 37.95 | 19 17.4     |

|        |          |      |       |             |             |
|--------|----------|------|-------|-------------|-------------|
| 2013eh | 0.034997 | 16.6 | Ia    | 16 16 09.19 | 32 53.0     |
| 2013ed | 0.033158 | 15.8 | Ia    | 16 16 24.25 | 53 05.7     |
| 2002de | 0.027965 | 16   | Ia    | 16 16 30.38 | 42 30.2     |
| 2001kt | 0.103791 | 19.9 | Ia    | 16 17 13.40 | 28 27.7     |
| 2013dp | 0.022324 | 15.5 | Ia    | 16 17 32.30 | 34 56.7     |
| 2010an | 0.02952  | 17   | Ia    | 16 17 40.46 | 00 10.1     |
| 2003ia | 0.02952  | 17.2 | Ia    | 16 17 41.17 | 00 07.2     |
| 2006dw | 0.027042 | 15.8 | Ia    | 16 17 43.29 | 57 55.1     |
| 2010fm | 0.36     | 21.6 | Ia    | 16 17 47.71 | 18 08.3     |
| 2011dl | 0.0341   | 16.9 | Ia    | 16 18 04.97 | 33 04.0     |
| 2012bp | 0.028291 | 15.5 | Ia    | 16 18 12.44 | 28 52.8     |
| 2010fn | 0.323    | 21.9 | Ia    | 16 18 15.87 | 23 04.9     |
| 2007en | 0.12     | 19.6 | Ia    | 16 18 43.84 | 3 02 50.1   |
| 2010fo | 0.347    | 22   | Ia    | 16 18 53.81 | 46 58.5     |
| 2002lj | 0.14     | 19.7 | Ia    | 16 19 19.65 | 09 54.2     |
| 2003lx | 0.037862 | 18.5 | Ia    | 16 19 21.66 | 05 23.6     |
| 1991ad | 0.069998 | 18.5 | Ia    | 16 19 24.20 | 38 46.0     |
| 2013cl | 0.06345  | 17.9 | Ia    | 16 19 31.59 | 47 11.3     |
| 2013cp | 0.074921 | 18.1 | Ia    | 16 19 52.11 | 56 08.1     |
| 2003ge | 0.033453 | 17.8 | Ia    | 16 20 08.75 | 47 53.7     |
| 2012ar | 0.028259 | 16.6 | Ia    | 16 20 36.02 | -10 27 38.2 |
| 2007bj | 0.016656 | 15.1 | IaPec | 16 22 10.59 | - 1 30 51.4 |
| 2009he | 0.030647 | 17.5 | IaPec | 16 22 12.33 | 16 22.5     |
| 2013cv | 0.035    | 16.5 | IaPec | 16 22 43.18 | 57 35.4     |
| 2006R  | 0.034074 | 17.5 | Ia    | 16 23 20.82 | 15 49.8     |
| 2012ds | 0.03403  | 16.4 | Ia    | 16 23 45.90 | 9 47 12.9   |
| 2009fl | 0.029146 | 17.6 | IaPec | 16 25 10.10 | 53 20.8     |
| 1999cb | 0.028899 | 15.7 | Ia    | 16 25 48.41 | 20 32.4     |
| 2014al | 0.04     | 16.8 | Ia    | 16 26 55.28 | 38 24.4     |
| 2012aj | 0.031    | 16.1 | Ia    | 16 27 03.96 | 36 49.8     |
| 2014bo | 0.133525 | 19.3 | Ia    | 16 27 46.15 | 44 23.7     |
| 2013ec | 0.081    | 18.5 | Ia    | 16 27 50.24 | 28 20.9     |
| 2010ef | 0.11     | 18.5 | Ia    | 16 28 52.10 | 22 29.0     |
| 2009fv | 0.029359 | 16.3 | Ia    | 16 29 44.22 | 48 41.8     |
| 1991aj | 0.031418 | 18   | Ia    | 16 29 44.90 | 46 43.0     |
| 2014dl | 0.032966 | 16.5 | IaPec | 16 29 46.09 | 8 38 30.6   |
| 1992ap | 0.029876 | 18   | Ia    | 16 30 27.46 | 29 18.3     |
| 2014ag | 0.031658 | 15.5 | Ia    | 16 30 40.68 | 30 34.7     |
| 2010gl | 0.0188   | 15.8 | Ia    | 16 31 38.62 | 37 26.2     |
| 2009ff | 0.17     | 20.5 | Ia    | 16 33 10.92 | 05 30.8     |
| 2003hq | 0.040001 | 17.1 | Ia    | 16 33 40.90 | 22 37.7     |
| 2001az | 0.040694 | 16.1 | Ia    | 16 34 27.71 | 01 46.8     |
| 2003il | 0.174997 | 23   | Ia:   | 16 35 47.50 | 13 26.9     |
| 1995O  | 0.175121 | 22   | Ia:   | 16 35 56.12 | 11 43.9     |
| 2002ll | 0.050001 | 20.5 | Ia:   | 16 37 08.30 | 24 37.7     |
| 1992R  | 0.052326 | 18   | Ia    | 16 37 10.48 | 10 00.4     |
| 1992ac | 0.052326 | 18   | Ia    | 16 37 10.48 | 10 04.4     |
| 2002aw | 0.026428 | 16.6 | Ia    | 16 37 29.06 | 52 49.7     |
| 2009ew | 0.09     | 18.7 | Ia    | 16 38 59.85 | 58 58.1     |
| 2009ae | 0.031147 | 16.5 | Ia    | 16 39 28.87 | 18 55.6     |

|        |          |      |       |             |             |
|--------|----------|------|-------|-------------|-------------|
| 2002lo | 0.14     | 21.8 | Ia    | 16 39 56.42 | 19 20.5     |
| 2002lp | 0.113998 | 20.4 | Ia    | 16 40 11.45 | 28 30.2     |
| 2002lq | 0.069998 | 21.9 | Ia    | 16 40 28.83 | 14 09.1     |
| 2013cw | 0.017505 | 16.9 | Ia    | 16 41 27.18 | 47 05.0     |
| 1991am | 0.061025 | 18   | Ia:   | 16 41 50.73 | 44 11.1     |
| 2007dr | 0.14     | 19.9 | Ia    | 16 41 56.00 | 22 59.1     |
| 2010dt | 0.052889 | 17.9 | Ia    | 16 43 14.68 | 40 30.4     |
| 2007gk | 0.026981 | 18.8 | Ia    | 16 45 18.22 | 55 50.0     |
| 2003dw | 0.02992  | 16.7 | Ia    | 16 45 51.10 | 37 38.0     |
| 2013dj | 0.025304 | 16.6 | IaPec | 16 46 01.94 | 6 27 59.3   |
| 2009fa | 0.042    | 17.7 | Ia    | 16 46 42.82 | 15 28.6     |
| 2007hh | 0.11     | 19.9 | Ia    | 16 46 59.10 | 56 02.5     |
| 2007is | 0.029653 | 16.3 | Ia    | 16 47 14.59 | 14 36.9     |
| 2009dx | 0.042    | 18.8 | Ia    | 16 49 25.67 | 5 52 48.1   |
| 1994Q  | 0.029477 | 17   | Ia    | 16 49 51.15 | 25 55.9     |
| 2009kp | 0.017758 | 15.1 | Ia    | 16 49 51.49 | 32 35.8     |
| 2011aj | 0.017556 | 16.6 | Ia    | 16 50 13.98 | 22 28.0     |
| 2002di | 0.036411 | 17.6 | IaPec | 16 52 23.30 | 42 40.0     |
| 2010dd | 0.02957  | 17.2 | Ia    | 16 52 47.60 | 03 45.7     |
| 2010gp | 0.024262 | 17.5 | Ia    | 16 52 57.39 | 2 23 16.4   |
| 2009fx | 0.047659 | 18   | IaPec | 16 53 11.28 | 57 54.9     |
| 2007ep | 0.12     | 19.4 | Ia    | 16 54 38.51 | 02 59.7     |
| 1999ch | 0.15     |      | Ia    | 16 54 45.69 | 59 13.9     |
| 1998cx | 0.019562 | 17.8 | Ia    | 16 54 55.31 | -72 35 24.0 |
| 2007hu | 0.034257 | 17.3 | Ia    | 16 56 29.96 | 58 40.4     |
| 2008dt | 0.034257 | 17.2 | Ia    | 16 56 30.56 | 58 33.2     |
| 2008eq | 0.056835 | 18.4 | Ia    | 17 00 07.20 | 07 56.6     |
| 2007ae | 0.064387 | 17.4 | Ia    | 17 01 51.95 | 01 54.6     |
| 2013dv | 0.057    | 17.1 | Ia    | 17 03 10.73 | 26 53.9     |
| 2010ag | 0.033803 | 18.6 | IaPec | 17 03 53.63 | 30 06.2     |
| 2013cx | 0.034    | 17.5 | Ia    | 17 04 16.05 | 30 37.6     |
| 2013ci | 0.036    | 16.1 | Ia    | 17 04 53.60 | 9 07 59.4   |
| 1997cd | 0.509999 | 22.9 | Ia    | 17 06 17.07 | 04 34.0     |
| 1997ce | 0.440001 | 23.3 | Ia    | 17 07 48.26 | 01 26.2     |
| 2010ed | 0.048974 | 18.7 | Ia    | 17 09 24.13 | 12 48.1     |
| 2011T  | 0.029193 | 16.3 | Ia    | 17 10 03.62 | 30 01.2     |
| 2012cx | 0.027672 | 17.3 | Ia    | 17 10 05.86 | 22 23.5     |
| 2001cp | 0.022416 | 15.9 | Ia    | 17 11 02.58 | 5 50 26.8   |
| 2002er | 0.008577 | 14.6 | Ia    | 17 11 29.88 | 7 59 44.8   |
| 1999bt | 0.049901 | 17   | Ia    | 17 11 37.77 | 25 15.5     |
| 2006mp | 0.023    | 16.7 | IaPec | 17 12 00.20 | 33 20.8     |
| 2008fj | 0.027015 | 18.6 | Ia    | 17 12 49.86 | 48 51.8     |
| 2011cm | 0.03     | 18.1 | Ia    | 17 14 19.18 | 59 55.2     |
| 1990O  | 0.030664 | 16.6 | Ia    | 17 15 35.92 | 19 25.8     |
| 2002bw | 0.017333 | 17.4 | Ia    | 17 16 35.60 | -10 20 31.8 |
| 2013bs | 0.027612 | 16   | Ia    | 17 17 22.03 | 04 00.2     |
| 2010gn | 0.0365   | 16.4 | Ia    | 17 17 49.90 | 52 52.0     |
| 2003ek | 0.036038 | 18.2 | Ia    | 17 18 32.50 | 40 00.8     |
| 2013dr | 0.016834 | 15.2 | Ia    | 17 19 30.22 | 42 04.3     |
| 2013cm | 0.04     | 18.3 | IaPec | 17 20 01.94 | 44 51.3     |

|        |          |      |       |             |             |
|--------|----------|------|-------|-------------|-------------|
| 2003U  | 0.02834  | 18   | Ia    | 17 22 45.66 | 09 50.4     |
| 2009ia | 0.027413 | 17.5 | Ia    | 17 26 11.25 | 18 31.3     |
| 1991af | 0.022388 | 18.5 | Ia    | 17 27 07.67 | 28 23.3     |
| 2007eo | 0.1      | 19   | Ia    | 17 28 46.33 | 10 40.3     |
| 2006ap | 0.022248 | 17.2 | Ia    | 17 30 41.19 | 6 16 33.1   |
| 2009hl | 0.049447 | 18   |       | 17 31 10.14 | 25 40.1     |
| 2007kf | 0.046698 | 17   | Ia    | 17 31 31.23 | 18 39.8     |
| 2012er | 0.039694 | 16   | Ia    | 17 31 52.62 | 50 10.1     |
| 2000gb | 0.122504 | 20.4 | Ia    | 17 32 28.54 | 04 25.5     |
| 1999da | 0.012275 | 16.1 | Ia    | 17 35 22.96 | 48 49.3     |
| 2009ex | 0.08     | 20.2 | Ia    | 17 38 26.07 | 23 00.7     |
| 2014bm | 0.041265 | 17.4 | Ia    | 17 42 32.11 | 35 41.2     |
| 2012fe | 0.05     | 17.5 | IaPec | 17 43 12.18 | 46 02.5     |
| 2005ao | 0.038406 | 16.6 | Ia    | 17 44 49.64 | 54 28.1     |
| 2012ea | 0.010209 | 16.4 | IaPec | 17 45 10.40 | 08 26.8     |
| 2013gz | 0.016401 | 16.3 | Ia    | 17 46 27.70 | 42 13.2     |
| 2011bd | 0.028246 | 16   | Ia    | 17 47 06.32 | 18 04.7     |
| 2012df | 0.07     | 18.2 | Ia    | 17 48 18.72 | 18 02.1     |
| 2012db | 0.019313 | 14.6 | Ia    | 17 48 48.70 | -60 42 19.3 |
| 2002by | 0.012451 | 14.5 | IaPec | 17 50 18.58 | -59 33 51.6 |
| 2013hm | 0.031988 | 17   | Ia    | 17 50 48.49 | 11 50.9     |
| 1998bp | 0.01046  | 14.6 | Ia    | 17 54 50.72 | 19 49.9     |
| 2009hs | 0.027495 | 18.1 | Ia    | 17 55 50.93 | 35 59.1     |
| 2000cn | 0.023449 | 16.6 | Ia    | 17 57 40.42 | 49 58.1     |
| 2010hh | 0.019114 | 17.6 | IaPec | 17 59 18.38 | 52 32.2     |

Table A3. Plot 3 Data from The SAI Supernova Catalog with calculated Trend.

| sn_name | redshift | sn_mag | sn_type | sn_ra       | sn_dec      | Trend   | Linesn_mag-Trend |
|---------|----------|--------|---------|-------------|-------------|---------|------------------|
| 2005ew  | 0.002998 | 15.1   | Ia      | 03 39 23.74 | 02 49.0     | 14.112  | 0.988            |
| 1993af  | 0.003345 | 17     | Ia:     | 05 08 00.71 | -37 29 18.0 | 14.2589 | 2.7411           |
| 2008ge  | 0.003502 | 12.4   | IaPec   | 04 08 24.68 | -47 53 47.4 | 14.3205 | -1.9205          |
| 2001el  | 0.003902 | 12.7   | Ia      | 03 44 30.59 | -44 38 23.6 | 14.4656 | -1.7656          |
| 2014dg  | 0.004005 | 14.9   | Ia      | 03 48 19.88 | 07 54.2     | 14.5005 | 0.3995           |
| 2005df  | 0.004319 | 12.5   | Ia      | 04 17 37.85 | -62 46 09.5 | 14.6018 | -2.1018          |
| 2003gs  | 0.004478 | 13.4   | IaPec   | 02 27 38.36 | - 1 09 35.4 | 14.6503 | -1.2503          |
| 2005ke  | 0.004879 | 16.3   | Ia      | 03 35 04.35 | -24 56 38.8 | 14.7654 | 1.5346           |
| 2010ey  | 0.004906 | 16.8   | Ia      | 03 41 31.50 | -19 54 00.4 | 14.7728 | 2.0272           |
| 2010el  | 0.005004 | 16.5   | IaPec   | 04 19 58.83 | -54 56 38.5 | 14.7993 | 1.7007           |
| 2006ce  | 0.005026 | 12.4   | Ia      | 02 22 54.63 | -21 14 29.4 | 14.8052 | -2.4052          |
| 2011ek  | 0.005031 | 16.1   | Ia      | 02 25 48.89 | 31 59.8     | 14.8065 | 1.2935           |
| 2012fr  | 0.005462 | 13.78  | Ia      | 03 33 36.23 | -36 07 35.4 | 14.9168 | -1.1368          |
| 2003hv  | 0.005619 | 12.5   | Ia      | 03 04 09.32 | -26 05 07.5 | 14.9548 | -2.4548          |
| 2003if  | 0.00566  | 17.6   | Ia      | 03 19 52.61 | -26 03 50.5 | 14.9646 | 2.6354           |
| 2006dd  | 0.005922 | 14     | Ia      | 03 22 41.62 | -37 12 13.0 | 15.0253 | -1.0253          |
| 2006mr  | 0.005922 | 15.14  | Ia      | 03 22 42.84 | -37 12 28.5 | 15.0253 | 0.1147           |
| 1992A   | 0.006152 | 12.6   | Ia      | 03 36 27.43 | -34 57 31.5 | 15.0764 | -2.4764          |
| 2007on  | 0.006338 | 14.9   | Ia      | 03 38 50.90 | -35 34 30.0 | 15.1164 | -0.2164          |
| 2011iv  | 0.006338 | 12.4   | Ia      | 03 38 51.34 | -35 35 31.8 | 15.1164 | -2.7164          |
| 2004ea  | 0.006517 | 18.2   | Ia      | 04 16 13.20 | -16 45 20.5 | 15.1538 | 3.0462           |

|        |          |      |        |             |             |         |         |
|--------|----------|------|--------|-------------|-------------|---------|---------|
| 2003hx | 0.007098 | 14.3 | Ia     | 05 46 46.97 | -16 47 00.6 | 15.2683 | -0.9683 |
| 2012Z  | 0.007127 | 15.6 | IaPec  | 03 22 05.35 | -15 23 15.6 | 15.2738 | 0.3262  |
| 2002fk | 0.007127 | 13.1 | Ia     | 03 22 05.71 | -15 24 03.2 | 15.2738 | -2.1738 |
| 2008hy | 0.008538 | 14.3 | Ia     | 03 45 08.45 | 39 55.5     | 15.5162 | -1.2162 |
| 2009ig | 0.008773 | 14   | Ia     | 02 38 11.61 | - 1 18 45.1 | 15.5526 | -1.5526 |
| 1994aa | 0.009059 | 17   | Ia     | 03 24 49.40 | - 3 02 33.6 | 15.5956 | 1.4044  |
| 2010lp | 0.01014  | 16.7 | IaPec  | 02 54 03.50 | 2 57 43.4   | 15.7469 | 0.9531  |
| 2013ex | 0.01043  | 15.6 | Ia     | 05 32 46.62 | -14 02 45.4 | 15.7847 | -0.1847 |
| 2010ko | 0.01043  | 16.8 | Ia     | 05 32 49.44 | -14 05 45.9 | 15.7847 | 1.0153  |
| 2008fg | 0.010884 | 17   | Ia     | 03 18 44.10 | 28 57.2     | 15.8419 | 1.1581  |
| 2009ab | 0.011171 | 16.5 | Ia     | 04 16 36.39 | 2 45 51.0   | 15.8768 | 0.6232  |
| 2001eb | 0.012652 | 16.3 | Ia     | 04 30 45.10 | 0 52 17.9   | 16.0439 | 0.2561  |
| 1991bd | 0.012731 | 17   | Ia     | 04 02 49.66 | 1 58 26.3   | 16.0522 | 0.9478  |
| 2001ep | 0.013012 | 15   | Ia     | 04 57 00.26 | - 4 45 40.2 | 16.0815 | -1.0815 |
| 1998eb | 0.013119 | 17.8 | Ia     | 05 42 12.02 | 22 26.3     | 16.0925 | 1.7075  |
| 2009im | 0.013164 | 15.1 | Ia     | 03 33 22.08 | - 4 59 56.8 | 16.0971 | -0.9971 |
| 2006lf | 0.013208 | 17.6 | Ia     | 04 38 29.49 | 02 01.5     | 16.1016 | 1.4984  |
| 2009F  | 0.013337 | 15.5 | Ia     | 04 59 23.56 | -11 07 50.1 | 16.1146 | -0.6146 |
| 2011U  | 0.01335  | 16.6 | Ia     | 04 13 33.94 | 32 36.7     | 16.1159 | 0.4841  |
| 2008R  | 0.013512 | 14.6 | Ia     | 03 03 53.72 | -11 59 39.3 | 16.1321 | -1.5321 |
| 1998dj | 0.013602 | 16   | Ia     | 02 01 06.92 | - 6 49 04.8 | 16.141  | -0.141  |
| 1996by | 0.013722 | 16.1 | Ia     | 05 58 24.96 | 27 12.1     | 16.1528 | -0.0528 |
| 2010it | 0.013754 | 15.9 | Ia     | 03 41 57.50 | - 4 42 21.1 | 16.1559 | -0.2559 |
| 2011dx | 0.013854 | 16.5 | IaPec  | 03 37 05.61 | - 5 01 56.3 | 16.1656 | 0.3344  |
| 2003hm | 0.013915 | 17.7 | Ia     | 02 48 58.39 | 3 10 07.6   | 16.1715 | 1.5285  |
| 1993ab | 0.013931 | 18   | Ia:    | 03 02 01.45 | 34 53.5     | 16.1731 | 1.8269  |
| 2013gy | 0.014069 | 17.9 | Ia     | 03 42 16.88 | - 4 43 18.5 | 16.1863 | 1.7137  |
| 2009bt | 0.014263 | 16.9 | Ia     | 03 08 56.99 | 33 35.1     | 16.2047 | 0.6953  |
| 1999dq | 0.014329 | 14.7 | IaPec  | 02 33 59.68 | 58 30.4     | 16.2109 | -1.5109 |
| 2005el | 0.01493  | 16   | Ia     | 05 11 48.72 | 5 11 39.4   | 16.266  | -0.266  |
| 1997dp | 0.01496  | 17.8 | Ia     | 02 34 06.48 | 56 13.4     | 16.2687 | 1.5313  |
| 2011iq | 0.015    | 18.3 | Ia     | 02 48 49.60 | - 8 04 30.0 | 16.2723 | 2.0277  |
| 2011hh | 0.015    | 16.9 | Ia     | 02 57 04.61 | 47 43.3     | 16.2723 | 0.6277  |
| 2014H  | 0.015    | 16.3 | Ia     | 03 37 01.41 | 05 01.0     | 16.2723 | 0.0277  |
| 2006dr | 0.015124 | 16.1 | Ia     | 03 17 14.19 | -32 34 31.8 | 16.2833 | -0.1833 |
| 2010ju | 0.015244 | 16.7 | Ia     | 05 41 55.99 | 29 51.0     | 16.2939 | 0.4061  |
| 2006hb | 0.01527  | 15.7 | IaPec  | 05 02 01.28 | -21 07 55.1 | 16.2962 | -0.5962 |
| 2009ic | 0.015347 | 14.8 | Ia     | 04 53 18.03 | - 3 00 59.6 | 16.3029 | -1.5029 |
| 2006P  | 0.015364 | 17.4 | Ia:    | 03 19 17.90 | -12 06 18.3 | 16.3044 | 1.0956  |
| 1995bd | 0.015393 | 17.3 | IaPec  | 04 45 21.24 | 04 02.5     | 16.307  | 0.993   |
| 2005ev | 0.0154   | 16   | Ia     | 02 31 04.93 | 42 06.5     | 16.3076 | -0.3076 |
| 2004B  | 0.01565  | 17.8 | Ia     | 04 42 04.72 | - 7 12 07.8 | 16.3292 | 1.4708  |
| 2012id | 0.015748 | 16.3 | Ia     | 04 42 41.13 | 34 59.8     | 16.3375 | -0.0375 |
| 2009J  | 0.015783 | 17.4 | IaPec  | 05 55 21.13 | -76 55 20.8 | 16.3405 | 1.0595  |
| 2009iw | 0.015783 | 14.6 | Ia     | 05 55 25.63 | -76 55 15.9 | 16.3405 | -1.7405 |
| 2008J  | 0.015941 | 15.4 | IInPec | 02 34 24.20 | -10 50 38.5 | 16.3539 | -0.9539 |
| 2006aw | 0.01617  | 14.9 | Ia     | 05 04 18.18 | -63 34 57.3 | 16.373  | -1.473  |
| 2011ka | 0.016408 | 14.5 | Ia     | 05 14 28.23 | -62 10 19.3 | 16.3926 | -1.8926 |
| 2010kg | 0.016646 | 17.7 | Ia     | 04 40 08.40 | 7 21 00.0   | 16.412  | 1.288   |
| 2008er | 0.016648 | 18.5 | Ia     | 02 04 36.27 | 56 10.4     | 16.4121 | 2.0879  |

|        |          |      |        |             |             |         |         |
|--------|----------|------|--------|-------------|-------------|---------|---------|
| 2007J  | 0.016788 | 17.3 | IbPec: | 02 18 51.70 | 43 43.3     | 16.4234 | 0.8766  |
| 2005dm | 0.016838 | 17.5 | IaPec  | 02 18 39.25 | - 6 54 10.8 | 16.4273 | 1.0727  |
| 2011gy | 0.016881 | 15.4 | Ia     | 03 29 35.30 | 52 03.3     | 16.4308 | -1.0308 |
| 2011fw | 0.016896 | 17.2 | Ia     | 03 20 54.21 | 52 05.0     | 16.432  | 0.768   |
| 2013fb | 0.016939 | 15.9 | Ia     | 02 22 42.07 | 16 01.0     | 16.4354 | -0.5354 |
| 2004gw | 0.01701  | 17.9 | Ia     | 05 08 48.41 | 26 20.7     | 16.441  | 1.459   |
| 2009fu | 0.017066 | 15.7 | Ia     | 02 12 09.10 | 33 55.1     | 16.4454 | -0.7454 |
| 2013hk | 0.017135 | 15.9 | Ia     | 03 02 10.85 | 55 38.8     | 16.4508 | -0.5508 |
| 2006ke | 0.017181 | 18.3 | Ia     | 05 52 37.38 | 49 00.5     | 16.4544 | 1.8456  |
| 2003F  | 0.017271 | 15.9 | Ia     | 05 11 33.01 | 03 28.4     | 16.4614 | -0.5614 |
| 2012en | 0.017295 | 17.8 | Ia     | 04 07 25.20 | 1 45 32.9   | 16.4633 | 1.3367  |
| 2004fz | 0.017308 | 15.9 | Ia     | 02 01 06.41 | 52 44.2     | 16.4643 | -0.5643 |
| 2004fd | 0.017323 | 15.7 | Ia     | 02 43 15.25 | 25 25.6     | 16.4654 | -0.7654 |
| 2012B  | 0.017341 | 16.4 | Ia     | 03 51 34.52 | 04 42.9     | 16.4668 | -0.0668 |
| 2008hs | 0.017413 | 17.3 | Ia     | 02 25 29.62 | 50 35.1     | 16.4724 | 0.8276  |
| 2011M  | 0.017425 | 17.1 | Ia     | 05 00 41.55 | 14 38.6     | 16.4733 | 0.6267  |
| 2006le | 0.017425 | 17.6 | Ia     | 05 00 41.99 | 15 19.0     | 16.4733 | 1.1267  |
| 1999ek | 0.017522 | 17.9 | Ia     | 05 36 31.60 | 38 17.8     | 16.4808 | 1.4192  |
| 2011hk | 0.017554 | 15.6 | IaPec  | 02 18 45.79 | - 6 38 30.6 | 16.4832 | -0.8832 |
| 2012fx | 0.017652 | 16.7 | IaPec  | 02 55 41.24 | -27 25 26.7 | 16.4907 | 0.2093  |
| 2005mz | 0.017678 | 18   | IaPec  | 03 19 49.88 | 30 18.6     | 16.4927 | 1.5073  |
| 2009le | 0.017791 | 16.1 | Ia     | 02 09 17.14 | -23 24 44.8 | 16.5012 | -0.4012 |
| 2003em | 0.017791 | 17.2 | Ia     | 02 09 20.23 | -23 24 53.0 | 16.5012 | 0.6988  |
| 2006ef | 0.017894 | 15.3 | Ia     | 02 04 19.51 | - 8 43 42.2 | 16.509  | -1.209  |
| 2010ia | 0.017909 | 17.3 | Ia     | 03 56 56.20 | 8 30 45.1   | 16.5101 | 0.7899  |
| 2002eh | 0.017974 | 16.4 | Ia     | 02 26 08.45 | 54 45.2     | 16.5149 | -0.1149 |
| 2002es | 0.017992 | 16   | IaPec  | 03 23 47.23 | 33 53.5     | 16.5163 | -0.5163 |
| 2008ey | 0.018084 | 18.1 | Ia     | 02 51 42.39 | 49 51.5     | 16.5231 | 1.5769  |
| 2003lb | 0.018105 | 15.8 | Ia     | 03 45 05.67 | 45 39.3     | 16.5247 | -0.7247 |
| 1991bj | 0.018132 | 18.8 | Ia     | 03 41 30.48 | - 4 39 49.6 | 16.5267 | 2.2733  |
| 2009km | 0.018346 | 15.6 | Ia     | 03 02 59.01 | -14 49 01.9 | 16.5424 | -0.9424 |
| 2003ij | 0.018382 | 17.8 | Ia     | 05 55 41.18 | 54 21.7     | 16.5451 | 1.2549  |
| 2006nr | 0.018382 | 15.8 | Ia     | 05 56 23.51 | 54 38.8     | 16.5451 | -0.7451 |
| 2011do | 0.018392 | 14.8 | Ia     | 04 25 47.56 | -67 48 40.7 | 16.5458 | -1.7458 |
| 2013S  | 0.018576 | 15.9 | Ia     | 03 35 30.29 | 16 59.3     | 16.5591 | -0.6591 |
| 2006em | 0.018866 | 17.4 | IaPec  | 02 25 44.30 | 56 31.8     | 16.5799 | 0.8201  |
| 2012fd | 0.018898 | 15.2 | Ia     | 05 58 51.93 | -23 20 24.2 | 16.5822 | -1.3822 |
| 2005A  | 0.019138 | 17.1 | Ia     | 02 30 43.25 | - 2 56 19.8 | 16.5991 | 0.5009  |
| 2001gc | 0.01929  | 15.5 | Ia     | 05 55 26.14 | 54 34.2     | 16.6097 | -1.1097 |
| 2012hp | 0.019456 | 16   | Ia     | 03 54 17.37 | 30 38.7     | 16.6212 | -0.6212 |
| 2008L  | 0.019483 | 17.8 | Ia     | 03 17 16.65 | 22 57.6     | 16.6231 | 1.1769  |
| 2008hm | 0.019664 | 17.2 | Ia     | 03 27 10.90 | 56 39.6     | 16.6355 | 0.5645  |
| 2004dt | 0.019707 | 15.9 | Ia     | 02 02 12.77 | - 0 05 51.5 | 16.6384 | -0.7384 |
| 2012U  | 0.019772 | 14.9 | Ia     | 02 06 04.33 | -55 11 37.5 | 16.6429 | -1.7429 |
| 1993Y  | 0.020009 | 17.1 | Ia     | 03 31 24.41 | 45 02.6     | 16.6588 | 0.4412  |
| 1992bc | 0.020163 | 15.2 | Ia     | 03 05 17.28 | -39 33 39.7 | 16.6691 | -1.4691 |
| 2003hz | 0.020173 | 16.7 | Ia     | 05 48 07.86 | 15 22.8     | 16.6698 | 0.0302  |
| 2013fe | 0.02032  | 14.4 | Ia     | 03 03 53.27 | -39 24 20.3 | 16.6795 | -2.2795 |
| 2010A  | 0.020334 | 15.8 | Ia     | 02 32 39.46 | 0 37 10.2   | 16.6805 | -0.8805 |
| 2012E  | 0.020384 | 15.5 | Ia     | 02 33 22.81 | 9 35 05.9   | 16.6838 | -1.1838 |

|        |          |      |       |             |             |         |         |
|--------|----------|------|-------|-------------|-------------|---------|---------|
| 2009la | 0.020385 | 15.8 | Ia    | 04 22 45.81 | -40 36 49.3 | 16.6838 | -0.8838 |
| 2014aj | 0.020395 | 17.6 | Ia    | 05 11 43.91 | 29 29.1     | 16.6845 | 0.9155  |
| 2004ee | 0.020509 | 17.2 | Ia    | 02 06 14.62 | -37 20 05.4 | 16.692  | 0.508   |
| 2013fz | 0.020607 | 15.1 | Ia    | 04 23 46.44 | -51 35 46.3 | 16.6984 | -1.5984 |
| 2014cd | 0.020607 | 15.9 | Ia    | 04 23 47.24 | -51 36 02.9 | 16.6984 | -0.7984 |
| 2009hp | 0.021016 | 16.7 | Ia    | 02 58 23.96 | 6 35 35.1   | 16.7247 | -0.0247 |
| 2005ls | 0.021136 | 15.8 | Ia    | 02 54 15.97 | 43 29.8     | 16.7324 | -0.9324 |
| 2006kf | 0.021251 | 17.4 | Ia    | 03 41 50.48 | 8 09 25.0   | 16.7396 | 0.6604  |
| 2011H  | 0.021331 | 15.6 | Ia    | 02 23 06.02 | 02 32.4     | 16.7447 | -1.1447 |
| 2003in | 0.021331 | 17.7 | Ia    | 03 35 33.31 | 5 03 52.7   | 16.7447 | 0.9553  |
| 1991bc | 0.021351 | 16   | Ia    | 03 20 45.66 | - 1 02 47.2 | 16.7459 | -0.7459 |
| 1994ah | 0.021664 | 18   | Ia    | 02 56 37.75 | -33 54 43.6 | 16.7655 | 1.2345  |
| 2009hn | 0.021855 | 17.5 | Ia    | 02 32 00.31 | 1 14 53.5   | 16.7772 | 0.7228  |
| 1997ej | 0.022302 | 16.5 | Ia    | 04 17 53.49 | -56 36 58.2 | 16.8044 | -0.3044 |
| 2014dn | 0.022302 | 17.1 | IaPec | 04 17 54.28 | -56 36 45.2 | 16.8044 | 0.2956  |
| 2010jm | 0.022362 | 17.4 | Ia    | 03 46 03.55 | 42 15.5     | 16.808  | 0.592   |
| 2009iv | 0.0226   | 17.6 | Ia    | 02 58 14.19 | 5 58 19.3   | 16.8222 | 0.7778  |
| 1995ak | 0.02272  | 16.2 | Ia    | 02 45 48.83 | 3 13 50.1   | 16.8293 | -0.6293 |
| 2007E  | 0.022962 | 15.9 | Ia    | 02 26 34.41 | -15 50 36.5 | 16.8435 | -0.9435 |
| 2014dd | 0.023244 | 17.5 | Ia    | 03 03 36.18 | 56 52.0     | 16.8599 | 0.6401  |
| 2010jf | 0.023949 | 17.7 | IaPec | 03 40 43.47 | 1 03 34.0   | 16.9    | 0.8     |
| 2009jz | 0.023959 | 17   | IaPec | 05 40 05.29 | -55 32 04.0 | 16.9006 | 0.0994  |
| 2004J  | 0.025    | 17.5 | Ia    | 05 46 32.18 | -17 46 53.0 | 16.9576 | 0.5424  |
| 2009D  | 0.025053 | 16.5 | Ia    | 03 54 22.83 | -19 10 54.2 | 16.9605 | -0.4605 |
| 2013hi | 0.025367 | 16.2 | Ia    | 03 14 24.72 | 10 49.1     | 16.9772 | -0.7772 |
| 2001dw | 0.02544  | 16.6 | Ia    | 03 00 47.88 | 46 27.5     | 16.981  | -0.381  |
| 2011hq | 0.025721 | 18.3 | Ia    | 05 00 56.13 | -13 24 57.9 | 16.9958 | 1.3042  |
| 2009I  | 0.026177 | 16.4 | Ia    | 02 45 10.40 | - 4 42 49.4 | 17.0194 | -0.6194 |
| 1991bb | 0.026563 | 17.7 | Ia    | 03 53 37.51 | 06 19.3     | 17.039  | 0.661   |
| 2010kq | 0.026596 | 16.4 | Ia    | 02 18 10.92 | 05 42.4     | 17.0407 | -0.6407 |
| 1999gp | 0.026744 | 16.1 | Ia    | 02 31 39.15 | 22 52.3     | 17.0481 | -0.9481 |
| 2011gs | 0.027    | 17.4 | Ia    | 04 21 09.99 | 28 04.4     | 17.0609 | 0.3391  |
| 2013D  | 0.027119 | 17.5 | IaPec | 03 41 15.13 | 23 03.9     | 17.0668 | 0.4332  |
| 2011ah | 0.027198 | 16   | Ia    | 05 53 50.77 | -32 44 44.2 | 17.0707 | -1.0707 |
| 2013ae | 0.028    | 16.2 | Ia    | 02 41 53.16 | 23 58.8     | 17.1097 | -0.9097 |
| 2012hx | 0.028    | 16.3 | Ia    | 05 01 29.88 | -13 43 46.4 | 17.1097 | -0.8097 |
| 2009ad | 0.028387 | 16.6 | Ia    | 05 03 33.38 | 6 39 35.7   | 17.1281 | -0.5281 |
| 2010he | 0.028412 | 16.8 | Ia    | 02 49 10.80 | -14 26 59.8 | 17.1293 | -0.3293 |
| 2000fs | 0.02884  | 18.7 | Ia    | 03 08 26.24 | 4 06 39.9   | 17.1493 | 1.5507  |
| 2012I  | 0.029    | 16.2 | Ia    | 02 58 27.83 | 6 11 25.3   | 17.1568 | -0.9568 |
| 2008gy | 0.029    | 16.8 | Ia    | 03 10 00.95 | 13 23.1     | 17.1568 | -0.3568 |
| 2005eq | 0.029026 | 17.2 | IaPec | 03 08 49.31 | - 7 01 59.7 | 17.158  | 0.042   |
| 2004go | 0.02903  | 16.5 | Ia    | 02 55 41.76 | -14 14 14.5 | 17.1582 | -0.6582 |
| 2005ec | 0.029263 | 16.6 | Ia    | 04 54 19.17 | 1 38 27.6   | 17.1689 | -0.5689 |
| 2013fh | 0.029803 | 17.8 | Ia    | 04 21 38.29 | -17 55 41.4 | 17.1934 | 0.6066  |
| 2007so | 0.02983  | 17   | Ia    | 02 47 43.13 | 15 14.8     | 17.1946 | -0.1946 |
| 2012eu | 0.029937 | 17.3 | Ia    | 03 13 04.16 | - 8 23 31.7 | 17.1994 | 0.1006  |
| 2002hu | 0.03     | 16.3 | Ia    | 02 18 20.06 | 27 58.8     | 17.2023 | -0.9023 |
| 2012gz | 0.03     | 17.2 | Ia    | 02 50 17.61 | 24 39.9     | 17.2023 | -0.0023 |
| 2006qw | 0.03     | 17.9 | Ia    | 03 08 46.88 | 56 26.0     | 17.2023 | 0.6977  |

|        |          |       |       |             |             |         |         |
|--------|----------|-------|-------|-------------|-------------|---------|---------|
| 2007gn | 0.03     | 18.3  | Ia    | 03 16 31.37 | 27 40.7     | 17.2023 | 1.0977  |
| 2007hg | 0.03     | 18    | Ia    | 04 08 32.65 | 2 22 43.7   | 17.2023 | 0.7977  |
| 2003ah | 0.03     | 17    | Ia    | 04 43 08.54 | 0 46 00.4   | 17.2023 | -0.2023 |
| 2014I  | 0.03012  | 17    | Ia    | 05 42 19.80 | -25 32 39.9 | 17.2076 | -0.2076 |
| 2003kd | 0.030187 | 16.7  | Ia    | 03 00 45.80 | 27 13.0     | 17.2106 | -0.5106 |
| 2000dx | 0.030345 | 16.3  | Ia    | 02 18 26.88 | 5 39 02.0   | 17.2176 | -0.9176 |
| 2005do | 0.030471 | 17.4  | Ia    | 03 02 00.42 | 34 34.2     | 17.2232 | 0.1768  |
| 2006rz | 0.03092  | 20    | Ia    | 03 46 06.78 | 0 23 23.1   | 17.2428 | 2.7572  |
| 2009aq | 0.031    | 16.8  | Ia    | 03 09 19.79 | 05 05.3     | 17.2462 | -0.4462 |
| 2012hh | 0.031185 | 16.7  | Ia    | 02 42 39.56 | 31 54.6     | 17.2542 | -0.5542 |
| 2012H  | 0.031852 | 16.5  | Ia    | 05 20 14.94 | -25 18 56.4 | 17.2826 | -0.7826 |
| 2004gc | 0.032088 | 17.4  | Ia    | 05 21 49.95 | 6 40 33.7   | 17.2925 | 0.1075  |
| 2010hk | 0.032102 | 17.6  | Ia    | 03 37 52.61 | 4 56 52.2   | 17.2931 | 0.3069  |
| 2011ag | 0.032343 | 17.3  | Ia    | 03 12 26.55 | 15 06.4     | 17.3031 | -0.0031 |
| 2011jq | 0.032604 | 18.4  | IaPec | 05 16 41.55 | 6 29 30.2   | 17.3139 | 1.0861  |
| 2006os | 0.03281  | 17.2  | Ia    | 02 55 01.01 | 00 34.8     | 17.3224 | -0.1224 |
| 2014dm | 0.033116 | 16.55 | Ia    | 04 08 07.13 | - 8 49 37.0 | 17.3348 | -0.7848 |
| 1999J  | 0.033299 | 17    | IaPec | 05 35 32.27 | -69 29 52.1 | 17.3422 | -0.3422 |
| 2008gp | 0.033523 | 18.1  | Ia    | 03 23 00.73 | 1 21 42.8   | 17.3512 | 0.7488  |
| 2011ik | 0.033758 | 17.2  | Ia    | 02 25 04.09 | 12 51.9     | 17.3606 | -0.1606 |
| 2013A  | 0.033805 | 16.5  | Ia    | 02 22 04.27 | 13 57.7     | 17.3625 | -0.8625 |
| 2013gv | 0.03412  | 17.76 | Ia    | 03 09 57.30 | 12 48.3     | 17.3749 | 0.3851  |
| 2003iv | 0.034372 | 17.1  | Ia    | 02 50 07.25 | 50 46.5     | 17.3848 | -0.2848 |
| 2005et | 0.034377 | 17.9  | Ia    | 02 56 30.53 | 56 12.8     | 17.385  | 0.515   |
| 2000dp | 0.034523 | 16.8  | Ia    | 02 52 44.41 | -14 31 54.7 | 17.3907 | -0.5907 |
| 2005eu | 0.034897 | 17.6  | Ia    | 02 27 43.26 | 10 36.6     | 17.4051 | 0.1949  |
| 2012fk | 0.035    | 16.7  | Ia    | 02 30 52.04 | 28 45.9     | 17.4091 | -0.7091 |

Table A4. Plot 4 Data from The SAI Supernova Catalog with calculated Trend.

| sn_name | redshift | sn_mag | sn_type | sn_ra       | sn_dec      | Trend Line | sn_mag - Trend |
|---------|----------|--------|---------|-------------|-------------|------------|----------------|
| 2013aa  | 0.004007 | 11.9   | Ia      | 14 32 33.88 | -44 13 27.8 | 13.7898    | -1.8898        |
| 2008cq  | 0.00421  | 14.4   | Ia      | 14 21 09.61 | -29 15 04.0 | 13.8698    | 0.5302         |
| 2007af  | 0.005471 | 15.3   | Ia      | 14 22 21.03 | - 0 23 37.6 | 14.2944    | 1.0056         |
| 2003du  | 0.006396 | 13.5   | Ia      | 14 34 35.80 | 20 03.8     | 14.5476    | -1.0476        |
| 2012ei  | 0.006417 | 14.7   | Ia      | 14 24 05.76 | 02 56.5     | 14.5529    | 0.1471         |
| 2005cf  | 0.006461 | 15.5   | Ia      | 15 21 32.21 | - 7 24 47.5 | 14.564     | 0.936          |
| 1991M   | 0.007236 | 14.4   | Ia      | 15 58 34.82 | 27 28.7     | 14.7476    | -0.3476        |
| 2006dy  | 0.007683 | 16.5   | Ia      | 14 22 11.50 | 55 14.0     | 14.8447    | 1.6553         |
| 2002er  | 0.008577 | 14.6   | Ia      | 17 11 29.88 | 7 59 44.8   | 15.0231    | -0.4231        |
| 1990M   | 0.008652 | 12.4   | Ia      | 14 11 29.30 | - 5 02 36.0 | 15.0372    | -2.6372        |
| 1991B   | 0.008713 | 16     | Ia      | 14 03 24.29 | - 6 04 22.9 | 15.0486    | 0.9514         |
| 2009mz  | 0.008713 | 14.7   | Ia      | 14 03 24.64 | - 6 03 31.3 | 15.0486    | -0.3486        |
| 2002jo  | 0.009172 | 16.3   | Ia      | 14 38 16.42 | 27 14.0     | 15.1318    | 1.1682         |
| 2009Y   | 0.009294 | 14.9   | Ia      | 14 42 24.55 | -17 14 46.3 | 15.1532    | -0.2532        |
| 1999cp  | 0.009485 | 14.2   | Ia      | 14 06 31.30 | - 5 26 49.0 | 15.1862    | -0.9862        |
| 2002cr  | 0.009485 | 14.2   | Ia      | 14 06 37.59 | - 5 26 21.9 | 15.1862    | -0.9862        |
| 1999ac  | 0.009497 | 14.2   | IaPec   | 16 07 15.01 | 7 58 20.4   | 15.1882    | -0.9882        |
| 2010bp  | 0.009663 | 15.2   | Ia      | 14 12 07.89 | -49 23 43.3 | 15.2163    | -0.0163        |
| 2012ea  | 0.010209 | 16.4   | IaPec   | 17 45 10.40 | 08 26.8     | 15.3054    | 1.0946         |

|        |          |      |       |             |             |         |         |
|--------|----------|------|-------|-------------|-------------|---------|---------|
| 1998bp | 0.01046  | 14.6 | Ia    | 17 54 50.72 | 19 49.9     | 15.3447 | -0.7447 |
| 1996aa | 0.010842 | 17   | Ia    | 14 18 25.16 | 29 41.9     | 15.4029 | 1.5971  |
| 2013gn | 0.010842 | 15.5 | Ia    | 14 18 28.54 | 30 24.2     | 15.4029 | 0.0971  |
| 2005bc | 0.012266 | 16.4 | Ia    | 14 37 15.05 | 27 23.1     | 15.6029 | 0.7971  |
| 1999da | 0.012275 | 16.1 | Ia    | 17 35 22.96 | 48 49.3     | 15.6041 | 0.4959  |
| 1998D  | 0.012309 | 15.5 | Ia    | 14 02 59.28 | 44 54.3     | 15.6085 | -0.1085 |
| 2002by | 0.012451 | 14.5 | IaPec | 17 50 18.58 | -59 33 51.6 | 15.6271 | -1.1271 |
| 2010V  | 0.01279  | 14.3 | Ia    | 14 28 38.46 | 38 09.5     | 15.6707 | -1.3707 |
| 2013dh | 0.013382 | 16.5 | IaPec | 15 30 01.09 | 59 12.9     | 15.744  | 0.756   |
| 1990L  | 0.014436 | 18   | Ia    | 15 36 29.15 | 29 59.5     | 15.8668 | 2.1332  |
| 2007ap | 0.015444 | 15.5 | Ia    | 15 56 23.06 | 30 57.9     | 15.9762 | -0.4762 |
| 2013gz | 0.016401 | 16.3 | Ia    | 17 46 27.70 | 42 13.2     | 16.0737 | 0.2263  |
| 2007bj | 0.016656 | 15.1 | IaPec | 16 22 10.59 | - 1 30 51.4 | 16.0987 | -0.9987 |
| 1997cn | 0.016766 | 16.2 | IaPec | 14 09 57.76 | 32 32.3     | 16.1093 | 0.0907  |
| 2013dr | 0.016834 | 15.2 | Ia    | 17 19 30.22 | 42 04.3     | 16.1159 | -0.9159 |
| 2002bw | 0.017333 | 17.4 | Ia    | 17 16 35.60 | -10 20 31.8 | 16.1632 | 1.2368  |
| 2013cw | 0.017505 | 16.9 | Ia    | 16 41 27.18 | 47 05.0     | 16.1792 | 0.7208  |
| 2011aj | 0.017556 | 16.6 | Ia    | 16 50 13.98 | 22 28.0     | 16.184  | 0.416   |
| 2009kp | 0.017758 | 15.1 | Ia    | 16 49 51.49 | 32 35.8     | 16.2025 | -1.1025 |
| 2012el | 0.018175 | 16.4 | Ia    | 15 39 57.23 | -30 33 18.8 | 16.2401 | 0.1599  |
| 2009gf | 0.018517 | 16.1 | Ia    | 14 15 37.11 | 16 48.6     | 16.2703 | -0.1703 |
| 2013eb | 0.018779 | 17.1 | Ia    | 15 11 14.80 | 09 11.1     | 16.2931 | 0.8069  |
| 2010gl | 0.0188   | 15.8 | Ia    | 16 31 38.62 | 37 26.2     | 16.2949 | -0.4949 |
| 2010hh | 0.019114 | 17.6 | IaPec | 17 59 18.38 | 52 32.2     | 16.3217 | 1.2783  |
| 2012db | 0.019313 | 14.6 | Ia    | 17 48 48.70 | -60 42 19.3 | 16.3385 | -1.7385 |
| 1998cx | 0.019562 | 17.8 | Ia    | 16 54 55.31 | -72 35 24.0 | 16.3593 | 1.4407  |
| 2009nk | 0.019639 | 17   | Ia    | 14 10 58.74 | 6 21 47.9   | 16.3657 | 0.6343  |
| 2004di | 0.019767 | 16.8 | Ia    | 15 55 41.00 | 51 49.0     | 16.3762 | 0.4238  |
| 2005S  | 0.019813 | 19.1 | Ia    | 14 08 28.84 | 7 03 27.2   | 16.38   | 2.72    |
| 2000Q  | 0.02     | 16   | Ia    | 16 05 11.85 | 39 51.5     | 16.3952 | -0.3952 |
| 2011is | 0.020869 | 16.6 | Ia    | 14 01 47.00 | 9 29 50.8   | 16.4641 | 0.1359  |
| 2004bw | 0.021198 | 17.6 | Ia    | 15 03 46.75 | - 3 18 16.4 | 16.4895 | 1.1105  |
| 2009dc | 0.021391 | 15.6 | IaPec | 15 51 12.11 | 42 28.2     | 16.5041 | -0.9041 |
| 2003K  | 0.021817 | 15.4 | Ia    | 15 32 01.91 | 14 35.9     | 16.5361 | -1.1361 |
| 1999dg | 0.021928 | 15.8 | Ia    | 15 11 28.41 | 29 05.7     | 16.5443 | -0.7443 |
| 2004cq | 0.021998 | 17.5 | Ia    | 15 31 19.76 | 16 52.1     | 16.5495 | 0.9505  |
| 2014M  | 0.0222   | 16.3 | Ia    | 15 15 17.18 | 29 09.7     | 16.5643 | -0.2643 |
| 2002ci | 0.022228 | 17.1 | Ia    | 16 15 37.95 | 19 17.4     | 16.5663 | 0.5337  |
| 2006ap | 0.022248 | 17.2 | Ia    | 17 30 41.19 | 6 16 33.1   | 16.5678 | 0.6322  |
| 2013dp | 0.022324 | 15.5 | Ia    | 16 17 32.30 | 34 56.7     | 16.5733 | -1.0733 |
| 1991af | 0.022388 | 18.5 | Ia    | 17 27 07.67 | 28 23.3     | 16.578  | 1.922   |
| 2001cp | 0.022416 | 15.9 | Ia    | 17 11 02.58 | 5 50 26.8   | 16.58   | -0.68   |
| 2009gb | 0.022572 | 14.9 | Ia    | 14 47 25.83 | -30 39 02.5 | 16.5912 | -1.6912 |
| 2009as | 0.022572 | 16.7 | Ia    | 14 47 26.64 | -30 39 34.5 | 16.5912 | 0.1088  |
| 2010gb | 0.022595 | 15.8 | Ia    | 15 38 39.79 | 00 19.9     | 16.5929 | -0.7929 |
| 2006mp | 0.023    | 16.7 | IaPec | 17 12 00.20 | 33 20.8     | 16.6217 | 0.0783  |
| 2000cn | 0.023449 | 16.6 | Ia    | 17 57 40.42 | 49 58.1     | 16.653  | -0.053  |
| 2007ao | 0.023734 | 17.7 | IaPec | 14 16 49.74 | 48 24.1     | 16.6726 | 1.0274  |
| 2010gp | 0.024262 | 17.5 | Ia    | 16 52 57.39 | 2 23 16.4   | 16.7082 | 0.7918  |
| 2011dz | 0.024598 | 16.4 | Ia    | 16 12 44.82 | 17 03.2     | 16.7305 | -0.3305 |

|        |          |      |       |             |             |         |         |
|--------|----------|------|-------|-------------|-------------|---------|---------|
| 2014by | 0.024794 | 16   | Ia    | 14 27 48.59 | 33 42.5     | 16.7434 | -0.7434 |
| 2003ar | 0.025214 | 16.8 | Ia    | 16 02 08.11 | 24 55.5     | 16.7706 | 0.0294  |
| 2013dj | 0.025304 | 16.6 | IaPec | 16 46 01.94 | 6 27 59.3   | 16.7764 | -0.1764 |
| 2009Q  | 0.025604 | 16.1 | Ia    | 15 40 12.88 | 44 18.1     | 16.7955 | -0.6955 |
| 2013hr | 0.026191 | 16.2 | Ia    | 14 59 00.81 | 48 47.5     | 16.8322 | -0.6322 |
| 2012T  | 0.026378 | 17.4 | IaPec | 14 01 41.69 | 49 33.9     | 16.8438 | 0.5562  |
| 2002aw | 0.026428 | 16.6 | Ia    | 16 37 29.06 | 52 49.7     | 16.8468 | -0.2468 |
| 2006dt | 0.026468 | 16.8 | Ia    | 14 35 43.11 | 8 17 55.8   | 16.8493 | -0.0493 |
| 2007gk | 0.026981 | 18.8 | Ia    | 16 45 18.22 | 55 50.0     | 16.8804 | 1.9196  |
| 2008fj | 0.027015 | 18.6 | Ia    | 17 12 49.86 | 48 51.8     | 16.8824 | 1.7176  |
| 2006dw | 0.027042 | 15.8 | Ia    | 16 17 43.29 | 57 55.1     | 16.884  | -1.084  |
| 2009ia | 0.027413 | 17.5 | Ia    | 17 26 11.25 | 18 31.3     | 16.9061 | 0.5939  |
| 2009hs | 0.027495 | 18.1 | Ia    | 17 55 50.93 | 35 59.1     | 16.911  | 1.189   |
| 2013bs | 0.027612 | 16   | Ia    | 17 17 22.03 | 04 00.2     | 16.9178 | -0.9178 |
| 2012cx | 0.027672 | 17.3 | Ia    | 17 10 05.86 | 22 23.5     | 16.9214 | 0.3786  |
| 2011jt | 0.027777 | 16.5 | Ia    | 14 53 23.01 | 2 57 43.1   | 16.9275 | -0.4275 |
| 2002de | 0.027965 | 16   | Ia    | 16 16 30.38 | 42 30.2     | 16.9384 | -0.9384 |
| 2011bd | 0.028246 | 16   | Ia    | 17 47 06.32 | 18 04.7     | 16.9546 | -0.9546 |
| 2012ar | 0.028259 | 16.6 | Ia    | 16 20 36.02 | -10 27 38.2 | 16.9554 | -0.3554 |
| 2012bp | 0.028291 | 15.5 | Ia    | 16 18 12.44 | 28 52.8     | 16.9572 | -1.4572 |
| 2003U  | 0.02834  | 18   | Ia    | 17 22 45.66 | 09 50.4     | 16.96   | 1.04    |
| 2001U  | 0.028422 | 17.3 | Ia    | 14 04 42.94 | -9 42 29.7  | 16.9647 | 0.3353  |
| 2011bz | 0.028422 | 17.4 | Ia    | 14 04 43.75 | -9 43 04.7  | 16.9647 | 0.4353  |
| 1999cb | 0.028899 | 15.7 | Ia    | 16 25 48.41 | 20 32.4     | 16.9917 | -1.2917 |
| 2014ac | 0.028935 | 16.6 | Ia    | 15 04 40.09 | 37 54.2     | 16.9937 | -0.3937 |
| 2007cc | 0.029083 | 15.8 | Ia    | 14 08 41.98 | -21 35 48.4 | 17.002  | -1.202  |
| 2009fl | 0.029146 | 17.6 | IaPec | 16 25 10.10 | 53 20.8     | 17.0055 | 0.5945  |
| 2001bs | 0.029186 | 18.2 | Ia    | 15 43 39.38 | 45 31.3     | 17.0077 | 1.1923  |
| 2011de | 0.029186 | 16.1 | Ia    | 15 43 53.25 | 45 42.5     | 17.0077 | -0.9077 |
| 2011T  | 0.029193 | 16.3 | Ia    | 17 10 03.62 | 30 01.2     | 17.0081 | -0.7081 |
| 2009fv | 0.029359 | 16.3 | Ia    | 16 29 44.22 | 48 41.8     | 17.0173 | -0.7173 |
| 1994Q  | 0.029477 | 17   | Ia    | 16 49 51.15 | 25 55.9     | 17.0238 | -0.0238 |
| 2010an | 0.02952  | 17   | Ia    | 16 17 40.46 | 00 10.1     | 17.0261 | -0.0261 |
| 2003ia | 0.02952  | 17.2 | Ia    | 16 17 41.17 | 00 07.2     | 17.0261 | 0.1739  |
| 2010dd | 0.02957  | 17.2 | Ia    | 16 52 47.60 | 03 45.7     | 17.0289 | 0.1711  |
| 2007is | 0.029653 | 16.3 | Ia    | 16 47 14.59 | 14 36.9     | 17.0334 | -0.7334 |
| 2008fn | 0.029843 | 16.8 | Ib/c  | 16 21 48.53 | 03 41.0     | 17.0438 | -0.2438 |
| 1992ap | 0.029876 | 18   | Ia    | 16 30 27.46 | 29 18.3     | 17.0456 | 0.9544  |
| 2002ck | 0.029882 | 15.9 | Ia    | 15 47 00.75 | -0 59 25.5  | 17.0459 | -1.1459 |
| 2003dw | 0.02992  | 16.7 | Ia    | 16 45 51.10 | 37 38.0     | 17.0479 | -0.3479 |
| 1997ct | 0.03     | 18.6 | Ia    | 14 07 26.88 | 26 05.9     | 17.0523 | 1.5477  |
| 2006bw | 0.03     | 16.6 | Ia    | 14 33 56.73 | 3 47 55.8   | 17.0523 | -0.4523 |
| 2008ba | 0.03     | 18.6 | Ia    | 16 05 49.17 | 27 17.2     | 17.0523 | 1.5477  |
| 2011cm | 0.03     | 18.1 | Ia    | 17 14 19.18 | 59 55.2     | 17.0523 | 1.0477  |
| 2002am | 0.03002  | 19.1 | Ia    | 14 02 03.14 | -10 35 23.9 | 17.0534 | 2.0466  |
| 2001ay | 0.030242 | 16.7 | Ia    | 14 26 17.00 | 14 55.8     | 17.0653 | -0.3653 |
| 2012ci | 0.030611 | 17.5 | Ia    | 14 38 23.48 | 20 55.1     | 17.0849 | 0.4151  |
| 2009he | 0.030647 | 17.5 | IaPec | 16 22 12.33 | 16 22.5     | 17.0869 | 0.4131  |
| 1990O  | 0.030664 | 16.6 | Ia    | 17 15 35.92 | 19 25.8     | 17.0878 | -0.4878 |
| 2003au | 0.030791 | 19.2 | Ia    | 16 11 11.56 | 15 58.2     | 17.0944 | 2.1056  |

|        |          |       |       |             |             |         |         |
|--------|----------|-------|-------|-------------|-------------|---------|---------|
| 2012aj | 0.031    | 16.1  | Ia    | 16 27 03.96 | 36 49.8     | 17.1054 | -1.0054 |
| 2011dv | 0.031103 | 16    | Ia    | 16 12 04.62 | 12 33.2     | 17.1108 | -1.1108 |
| 2009ae | 0.031147 | 16.5  | Ia    | 16 39 28.87 | 18 55.6     | 17.1131 | -0.6131 |
| 1999cc | 0.031328 | 16.1  | Ia    | 16 02 42.03 | 21 34.4     | 17.1225 | -1.0225 |
| 1991aj | 0.031418 | 18    | Ia    | 16 29 44.90 | 46 43.0     | 17.1271 | 0.8729  |
| 2014ag | 0.031658 | 15.5  | Ia    | 16 30 40.68 | 30 34.7     | 17.1395 | -1.6395 |
| 2007ai | 0.031661 | 17.3  | Ia    | 16 12 53.74 | -21 37 48.7 | 17.1396 | 0.1604  |
| 2013hm | 0.031988 | 17    | Ia    | 17 50 48.49 | 11 50.9     | 17.1563 | -0.1563 |
| 2006bt | 0.032155 | 17.4  | Ia    | 15 56 30.53 | 02 45.6     | 17.1647 | 0.2353  |
| 2007bk | 0.032188 | 16.65 | Ia    | 15 28 45.58 | 52 12.8     | 17.1664 | -0.5164 |
| 2006cc | 0.032612 | 18.1  | Ia    | 16 09 56.47 | 07 35.9     | 17.1876 | 0.9124  |
| 2007cf | 0.032836 | 17.9  | Ia    | 15 23 07.66 | 8 31 45.5   | 17.1987 | 0.7013  |
| 2009ih | 0.032882 | 17.3  | IaPec | 15 55 31.05 | 56 54.0     | 17.2009 | 0.0991  |
| 2014dl | 0.032966 | 16.5  | IaPec | 16 29 46.09 | 8 38 30.6   | 17.2051 | -0.7051 |
| 2013ed | 0.033158 | 15.8  | Ia    | 16 16 24.25 | 53 05.7     | 17.2145 | -1.4145 |
| 2014cb | 0.033183 | 16.4  | Ia    | 14 50 49.90 | -13 31 03.7 | 17.2157 | -0.8157 |
| 2012M  | 0.033266 | 16.9  | Ia    | 14 56 59.85 | 35 59.6     | 17.2197 | -0.3197 |
| 2008af | 0.033366 | 17.1  | Ia    | 14 59 28.50 | 39 12.3     | 17.2246 | -0.1246 |
| 2004ct | 0.033373 | 17.5  | Ia    | 15 43 45.75 | 24 59.5     | 17.2249 | 0.2751  |
| 2003ge | 0.033453 | 17.8  | Ia    | 16 20 08.75 | 47 53.7     | 17.2288 | 0.5712  |
| 2010ag | 0.033803 | 18.6  | IaPec | 17 03 53.63 | 30 06.2     | 17.2457 | 1.3543  |
| 2013cx | 0.034    | 17.5  | Ia    | 17 04 16.05 | 30 37.6     | 17.2551 | 0.2449  |
| 2012ds | 0.03403  | 16.4  | Ia    | 16 23 45.90 | 9 47 12.9   | 17.2565 | -0.8565 |
| 2006R  | 0.034074 | 17.5  | Ia    | 16 23 20.82 | 15 49.8     | 17.2586 | 0.2414  |
| 2011dl | 0.0341   | 16.9  | Ia    | 16 18 04.97 | 33 04.0     | 17.2599 | -0.3599 |
| 2000cp | 0.034223 | 18    | Ia    | 16 05 27.62 | 49 48.8     | 17.2657 | 0.7343  |
| 2007hu | 0.034257 | 17.3  | Ia    | 16 56 29.96 | 58 40.4     | 17.2673 | 0.0327  |
| 2008dt | 0.034257 | 17.2  | Ia    | 16 56 30.56 | 58 33.2     | 17.2673 | -0.0673 |
| 2008ek | 0.034537 | 18.9  | Ia    | 16 05 33.17 | 35 33.2     | 17.2805 | 1.6195  |
| 2001ck | 0.034697 | 16.4  | Ia    | 14 37 50.08 | 29 02.2     | 17.288  | -0.888  |
| 2005be | 0.034997 | 16.1  | Ia    | 14 59 32.72 | 40 11.6     | 17.3019 | -1.2019 |
| 2013eh | 0.034997 | 16.6  | Ia    | 16 16 09.19 | 32 53.0     | 17.3019 | -0.7019 |
| 2013cv | 0.035    | 16.5  | IaPec | 16 22 43.18 | 57 35.4     | 17.3021 | -0.8021 |

Table A5. Plot 5 Data from The SAI Supernova Catalog with calculated sn\_mag -Trend.

| sn_name | redshift | sn_mag | sn_type | sn_ra       | sn_dec      | Trend Line | sn_mag-Trend |
|---------|----------|--------|---------|-------------|-------------|------------|--------------|
| 2014dg  | 0.004005 | 14.9   | Ia      | 03 48 19.88 | 07 54.2     | 14.5005    | 0.3995       |
| 2006mr  | 0.005922 | 15.14  | Ia      | 03 22 42.84 | -37 12 28.5 | 15.0253    | 0.1147       |
| 2007on  | 0.006338 | 14.9   | Ia      | 03 38 50.90 | -35 34 30.0 | 15.1164    | -0.2164      |
| 2012Z   | 0.007127 | 15.6   | IaPec   | 03 22 05.35 | -15 23 15.6 | 15.2738    | 0.3262       |
| 2013ex  | 0.01043  | 15.6   | Ia      | 05 32 46.62 | -14 02 45.4 | 15.7847    | -0.1847      |
| 2001eb  | 0.012652 | 16.3   | Ia      | 04 30 45.10 | 0 52 17.9   | 16.0439    | 0.2561       |
| 2011U   | 0.01335  | 16.6   | Ia      | 04 13 33.94 | 32 36.7     | 16.1159    | 0.4841       |
| 1998dj  | 0.013602 | 16     | Ia      | 02 01 06.92 | - 6 49 04.8 | 16.141     | -0.141       |
| 1996by  | 0.013722 | 16.1   | Ia      | 05 58 24.96 | 27 12.1     | 16.1528    | -0.0528      |
| 2010it  | 0.013754 | 15.9   | Ia      | 03 41 57.50 | - 4 42 21.1 | 16.1559    | -0.2559      |
| 2011dx  | 0.013854 | 16.5   | IaPec   | 03 37 05.61 | - 5 01 56.3 | 16.1656    | 0.3344       |
| 2005el  | 0.01493  | 16     | Ia      | 05 11 48.72 | 5 11 39.4   | 16.266     | -0.266       |
| 2014H   | 0.015    | 16.3   | Ia      | 03 37 01.41 | 05 01.0     | 16.2723    | 0.0277       |

|        |          |       |       |             |             |         |         |
|--------|----------|-------|-------|-------------|-------------|---------|---------|
| 2006dr | 0.015124 | 16.1  | Ia    | 03 17 14.19 | -32 34 31.8 | 16.2833 | -0.1833 |
| 2010ju | 0.015244 | 16.7  | Ia    | 05 41 55.99 | 29 51.0     | 16.2939 | 0.4061  |
| 2005ev | 0.0154   | 16    | Ia    | 02 31 04.93 | 42 06.5     | 16.3076 | -0.3076 |
| 2012id | 0.015748 | 16.3  | Ia    | 04 42 41.13 | 34 59.8     | 16.3375 | -0.0375 |
| 2012B  | 0.017341 | 16.4  | Ia    | 03 51 34.52 | 04 42.9     | 16.4668 | -0.0668 |
| 2012fx | 0.017652 | 16.7  | IaPec | 02 55 41.24 | -27 25 26.7 | 16.4907 | 0.2093  |
| 2009le | 0.017791 | 16.1  | Ia    | 02 09 17.14 | -23 24 44.8 | 16.5012 | -0.4012 |
| 2002eh | 0.017974 | 16.4  | Ia    | 02 26 08.45 | 54 45.2     | 16.5149 | -0.1149 |
| 1993Y  | 0.020009 | 17.1  | Ia    | 03 31 24.41 | 45 02.6     | 16.6588 | 0.4412  |
| 2003hz | 0.020173 | 16.7  | Ia    | 05 48 07.86 | 15 22.8     | 16.6698 | 0.0302  |
| 2009hp | 0.021016 | 16.7  | Ia    | 02 58 23.96 | 6 35 35.1   | 16.7247 | -0.0247 |
| 1997ej | 0.022302 | 16.5  | Ia    | 04 17 53.49 | -56 36 58.2 | 16.8044 | -0.3044 |
| 2014dn | 0.022302 | 17.1  | IaPec | 04 17 54.28 | -56 36 45.2 | 16.8044 | 0.2956  |
| 2009jz | 0.023959 | 17    | IaPec | 05 40 05.29 | -55 32 04.0 | 16.9006 | 0.0994  |
| 2009D  | 0.025053 | 16.5  | Ia    | 03 54 22.83 | -19 10 54.2 | 16.9605 | -0.4605 |
| 2001dw | 0.02544  | 16.6  | Ia    | 03 00 47.88 | 46 27.5     | 16.981  | -0.381  |
| 2011gs | 0.027    | 17.4  | Ia    | 04 21 09.99 | 28 04.4     | 17.0609 | 0.3391  |
| 2013D  | 0.027119 | 17.5  | IaPec | 03 41 15.13 | 23 03.9     | 17.0668 | 0.4332  |
| 2010he | 0.028412 | 16.8  | Ia    | 02 49 10.80 | -14 26 59.8 | 17.1293 | -0.3293 |
| 2008gy | 0.029    | 16.8  | Ia    | 03 10 00.95 | 13 23.1     | 17.1568 | -0.3568 |
| 2005eq | 0.029026 | 17.2  | IaPec | 03 08 49.31 | -7 01 59.7  | 17.158  | 0.042   |
| 2007so | 0.02983  | 17    | Ia    | 02 47 43.13 | 15 14.8     | 17.1946 | -0.1946 |
| 2012eu | 0.029937 | 17.3  | Ia    | 03 13 04.16 | -8 23 31.7  | 17.1994 | 0.1006  |
| 2012gz | 0.03     | 17.2  | Ia    | 02 50 17.61 | 24 39.9     | 17.2023 | -0.0023 |
| 2003ah | 0.03     | 17    | Ia    | 04 43 08.54 | 0 46 00.4   | 17.2023 | -0.2023 |
| 2014I  | 0.03012  | 17    | Ia    | 05 42 19.80 | -25 32 39.9 | 17.2076 | -0.2076 |
| 2005do | 0.030471 | 17.4  | Ia    | 03 02 00.42 | 34 34.2     | 17.2232 | 0.1768  |
| 2009aq | 0.031    | 16.8  | Ia    | 03 09 19.79 | 05 05.3     | 17.2462 | -0.4462 |
| 2004gc | 0.032088 | 17.4  | Ia    | 05 21 49.95 | 6 40 33.7   | 17.2925 | 0.1075  |
| 2010hk | 0.032102 | 17.6  | Ia    | 03 37 52.61 | 4 56 52.2   | 17.2931 | 0.3069  |
| 2011ag | 0.032343 | 17.3  | Ia    | 03 12 26.55 | 15 06.4     | 17.3031 | -0.0031 |
| 2006os | 0.03281  | 17.2  | Ia    | 02 55 01.01 | 00 34.8     | 17.3224 | -0.1224 |
| 1999J  | 0.033299 | 17    | IaPec | 05 35 32.27 | -69 29 52.1 | 17.3422 | -0.3422 |
| 2011ik | 0.033758 | 17.2  | Ia    | 02 25 04.09 | 12 51.9     | 17.3606 | -0.1606 |
| 2013gv | 0.03412  | 17.76 | Ia    | 03 09 57.30 | 12 48.3     | 17.3749 | 0.3851  |
| 2003iv | 0.034372 | 17.1  | Ia    | 02 50 07.25 | 50 46.5     | 17.3848 | -0.2848 |
| 2005eu | 0.034897 | 17.6  | Ia    | 02 27 43.26 | 10 36.6     | 17.4051 | 0.1949  |

Table A6. Plot6 Data from The SAI Supernova Catalog with calculated sn\_mag -Trend.

| sn_name | redshift | sn_mag | sn_type | sn_ra       | sn_dec      | Trend Line | sn_mag - Trend |
|---------|----------|--------|---------|-------------|-------------|------------|----------------|
| 2012ei  | 0.006417 | 14.7   | Ia      | 14 24 05.76 | 02 56.5     | 14.5529    | 0.1471         |
| 1991M   | 0.007236 | 14.4   | Ia      | 15 58 34.82 | 27 28.7     | 14.7476    | -0.3476        |
| 2002er  | 0.008577 | 14.6   | Ia      | 17 11 29.88 | 7 59 44.8   | 15.0231    | -0.4231        |
| 2009mz  | 0.008713 | 14.7   | Ia      | 14 03 24.64 | -6 03 31.3  | 15.0486    | -0.3486        |
| 2009Y   | 0.009294 | 14.9   | Ia      | 14 42 24.55 | -17 14 46.3 | 15.1532    | -0.2532        |
| 2010bp  | 0.009663 | 15.2   | Ia      | 14 12 07.89 | -49 23 43.3 | 15.2163    | -0.0163        |
| 2013gn  | 0.010842 | 15.5   | Ia      | 14 18 28.54 | 30 24.2     | 15.4029    | 0.0971         |
| 1999da  | 0.012275 | 16.1   | Ia      | 17 35 22.96 | 48 49.3     | 15.6041    | 0.4959         |
| 1998D   | 0.012309 | 15.5   | Ia      | 14 02 59.28 | 44 54.3     | 15.6085    | -0.1085        |

|        |          |      |       |             |             |         |         |
|--------|----------|------|-------|-------------|-------------|---------|---------|
| 2007ap | 0.015444 | 15.5 | Ia    | 15 56 23.06 | 30 57.9     | 15.9762 | -0.4762 |
| 2013gz | 0.016401 | 16.3 | Ia    | 17 46 27.70 | 42 13.2     | 16.0737 | 0.2263  |
| 1997cn | 0.016766 | 16.2 | IaPec | 14 09 57.76 | 32 32.3     | 16.1093 | 0.0907  |
| 2011aj | 0.017556 | 16.6 | Ia    | 16 50 13.98 | 22 28.0     | 16.184  | 0.416   |
| 2012el | 0.018175 | 16.4 | Ia    | 15 39 57.23 | -30 33 18.8 | 16.2401 | 0.1599  |
| 2009gf | 0.018517 | 16.1 | Ia    | 14 15 37.11 | 16 48.6     | 16.2703 | -0.1703 |
| 2010gl | 0.0188   | 15.8 | Ia    | 16 31 38.62 | 37 26.2     | 16.2949 | -0.4949 |
| 2004di | 0.019767 | 16.8 | Ia    | 15 55 41.00 | 51 49.0     | 16.3762 | 0.4238  |
| 2000Q  | 0.02     | 16   | Ia    | 16 05 11.85 | 39 51.5     | 16.3952 | -0.3952 |
| 2011is | 0.020869 | 16.6 | Ia    | 14 01 47.00 | 9 29 50.8   | 16.4641 | 0.1359  |
| 2014M  | 0.0222   | 16.3 | Ia    | 15 15 17.18 | 29 09.7     | 16.5643 | -0.2643 |
| 2009as | 0.022572 | 16.7 | Ia    | 14 47 26.64 | -30 39 34.5 | 16.5912 | 0.1088  |
| 2006mp | 0.023    | 16.7 | IaPec | 17 12 00.20 | 33 20.8     | 16.6217 | 0.0783  |
| 2000cn | 0.023449 | 16.6 | Ia    | 17 57 40.42 | 49 58.1     | 16.653  | -0.053  |
| 2011dz | 0.024598 | 16.4 | Ia    | 16 12 44.82 | 17 03.2     | 16.7305 | -0.3305 |
| 2003ar | 0.025214 | 16.8 | Ia    | 16 02 08.11 | 24 55.5     | 16.7706 | 0.0294  |
| 2013dj | 0.025304 | 16.6 | IaPec | 16 46 01.94 | 6 27 59.3   | 16.7764 | -0.1764 |
| 2002aw | 0.026428 | 16.6 | Ia    | 16 37 29.06 | 52 49.7     | 16.8468 | -0.2468 |
| 2006dt | 0.026468 | 16.8 | Ia    | 14 35 43.11 | 8 17 55.8   | 16.8493 | -0.0493 |
| 2012cx | 0.027672 | 17.3 | Ia    | 17 10 05.86 | 22 23.5     | 16.9214 | 0.3786  |
| 2011jt | 0.027777 | 16.5 | Ia    | 14 53 23.01 | 2 57 43.1   | 16.9275 | -0.4275 |
| 2012ar | 0.028259 | 16.6 | Ia    | 16 20 36.02 | -10 27 38.2 | 16.9554 | -0.3554 |
| 2001U  | 0.028422 | 17.3 | Ia    | 14 04 42.94 | -9 42 29.7  | 16.9647 | 0.3353  |
| 2011bz | 0.028422 | 17.4 | Ia    | 14 04 43.75 | -9 43 04.7  | 16.9647 | 0.4353  |
| 2014ac | 0.028935 | 16.6 | Ia    | 15 04 40.09 | 37 54.2     | 16.9937 | -0.3937 |
| 1994Q  | 0.029477 | 17   | Ia    | 16 49 51.15 | 25 55.9     | 17.0238 | -0.0238 |
| 2010an | 0.02952  | 17   | Ia    | 16 17 40.46 | 00 10.1     | 17.0261 | -0.0261 |
| 2003ia | 0.02952  | 17.2 | Ia    | 16 17 41.17 | 00 07.2     | 17.0261 | 0.1739  |
| 2010dd | 0.02957  | 17.2 | Ia    | 16 52 47.60 | 03 45.7     | 17.0289 | 0.1711  |
| 2008fn | 0.029843 | 16.8 | Ib/c  | 16 21 48.53 | 03 41.0     | 17.0438 | -0.2438 |
| 2003dw | 0.02992  | 16.7 | Ia    | 16 45 51.10 | 37 38.0     | 17.0479 | -0.3479 |
| 2006bw | 0.03     | 16.6 | Ia    | 14 33 56.73 | 3 47 55.8   | 17.0523 | -0.4523 |
| 2001ay | 0.030242 | 16.7 | Ia    | 14 26 17.00 | 14 55.8     | 17.0653 | -0.3653 |
| 2012ci | 0.030611 | 17.5 | Ia    | 14 38 23.48 | 20 55.1     | 17.0849 | 0.4151  |
| 2009he | 0.030647 | 17.5 | IaPec | 16 22 12.33 | 16 22.5     | 17.0869 | 0.4131  |
| 1990O  | 0.030664 | 16.6 | Ia    | 17 15 35.92 | 19 25.8     | 17.0878 | -0.4878 |
| 2007ai | 0.031661 | 17.3 | Ia    | 16 12 53.74 | -21 37 48.7 | 17.1396 | 0.1604  |
| 2013hm | 0.031988 | 17   | Ia    | 17 50 48.49 | 11 50.9     | 17.1563 | -0.1563 |
| 2006bt | 0.032155 | 17.4 | Ia    | 15 56 30.53 | 02 45.6     | 17.1647 | 0.2353  |
| 2009ih | 0.032882 | 17.3 | IaPec | 15 55 31.05 | 56 54.0     | 17.2009 | 0.0991  |
| 2012M  | 0.033266 | 16.9 | Ia    | 14 56 59.85 | 35 59.6     | 17.2197 | -0.3197 |
| 2008af | 0.033366 | 17.1 | Ia    | 14 59 28.50 | 39 12.3     | 17.2246 | -0.1246 |
| 2004ct | 0.033373 | 17.5 | Ia    | 15 43 45.75 | 24 59.5     | 17.2249 | 0.2751  |
| 2013cx | 0.034    | 17.5 | Ia    | 17 04 16.05 | 30 37.6     | 17.2551 | 0.2449  |
| 2006R  | 0.034074 | 17.5 | Ia    | 16 23 20.82 | 15 49.8     | 17.2586 | 0.2414  |
| 2011dl | 0.0341   | 16.9 | Ia    | 16 18 04.97 | 33 04.0     | 17.2599 | -0.3599 |
| 2007hu | 0.034257 | 17.3 | Ia    | 16 56 29.96 | 58 40.4     | 17.2673 | 0.0327  |
| 2008dt | 0.034257 | 17.2 | Ia    | 16 56 30.56 | 58 33.2     | 17.2673 | -0.0673 |

Table A7. Plot 7 and 8 Data Adapted from The SAI Supernova Catalog.

| Sequenc<br>ce | Redsh<br>ift | $2 \leq RA \leq 5$<br>sn_mag | $14 \leq RA < 17$<br>sn_mag | Dist.<br>Modulus | exponen<br>t | parsecs/2dist (LY)<br>km/year |          |           |          | km/s/MP<br>C |
|---------------|--------------|------------------------------|-----------------------------|------------------|--------------|-------------------------------|----------|-----------|----------|--------------|
| 1             | 0.001        | 12.94754068                  | 11.30808329                 | 1.639457385      | 1.327891477  | 10.63803                      | 34.67999 | 23826467. | 2.461349 | 516          |
| 2             | 0.002        | 13.80371608                  | 12.4741648                  | 1.329551281      | 1.265910256  | 9.223170                      | 30.06753 | 20657532. | 2.133988 | 466          |
| 3             | 0.003        | 14.30454658                  | 13.15627875                 | 1.148267831      | 1.229653566  | 8.484447                      | 27.65929 | 19002981. | 1.963068 | 154          |
| 4             | 0.004        | 14.65989147                  | 13.6402463                  | 1.019645176      | 1.203929035  | 7.996483                      | 26.06853 | 17910067. | 1.850166 | 644          |
| 5             | 0.005        | 14.93551839                  | 14.01564069                 | 0.919877695      | 1.183975539  | 7.637400                      | 24.89792 | 17105812. | 1.767084 | 635          |
| 6             | 0.006        | 15.16072198                  | 14.32236025                 | 0.838361727      | 1.167672345  | 7.356010                      | 23.98059 | 16475572. | 1.701978 | 842          |
| 7             | 0.007        | 15.3511289                   | 14.58168794                 | 0.769440958      | 1.153888192  | 7.126203                      | 23.23142 | 15960863. | 1.648807 | 686          |
| 8             | 0.008        | 15.51606687                  | 14.8063278                  | 0.709739072      | 1.141947814  | 6.932946                      | 22.60140 | 15528016. | 1.604093 | 304          |
| 9             | 0.009        | 15.66155248                  | 15.0044742                  | 0.657078277      | 1.131415655  | 6.766836                      | 22.05988 | 15155973. | 1.565660 | 039          |
| 10            | 0.01         | 15.79169379                  | 15.1817222                  | 0.60997159       | 1.121994318  | 6.621621                      | 21.58648 | 14830728. | 1.532061 | 255          |
| 11            | 0.011        | 15.90942092                  | 15.34206251                 | 0.567358409      | 1.113471682  | 6.492944                      | 21.16699 | 14542526. | 1.502289 | 021          |
| 12            | 0.012        | 16.01689737                  | 15.48844175                 | 0.528455622      | 1.105691124  | 6.377656                      | 20.79116 | 14284311. | 1.475614 | 575          |
| 13            | 0.013        | 16.11576613                  | 15.6230976                  | 0.492668528      | 1.098533706  | 6.273410                      | 20.45131 | 14050826. | 1.451494 | 91           |
| 14            | 0.014        | 16.20730429                  | 15.74776944                 | 0.459534853      | 1.091906971  | 6.178413                      | 20.14162 | 13838058. | 1.429515 | 216          |
| 15            | 0.015        | 16.29252429                  | 15.86383615                 | 0.42868814       | 1.085737628  | 6.091266                      | 19.85753 | 13642872. | 1.409351 | 882          |
| 16            | 0.016        | 16.37224227                  | 15.9724093                  | 0.399832968      | 1.079966594  | 6.010859                      | 19.59540 | 13462780. | 1.390747 | 875          |
| 17            | 0.017        | 16.4471258                   | 16.0743981                  | 0.372727699      | 1.07454554   | 5.936295                      | 19.35232 | 13295776. | 1.373495 | 85           |
| 18            | 0.018        | 16.51772787                  | 16.1705557                  | 0.347172172      | 1.069434434  | 5.866842                      | 19.12590 | 13140219. | 1.357426 | 259          |
| 19            | 0.019        | 16.58451171                  | 16.26151299                 | 0.322998718      | 1.064599744  | 5.801893                      | 18.91417 | 12994749. | 1.342398 | 8            |
| 20            | 0.02         | 16.64786918                  | 16.3478037                  | 0.300065486      | 1.060013097  | 5.740941                      | 18.71546 | 12858232. | 1.328296 | 134          |
| 21            | 0.021        | 16.70813479                  | 16.42988339                 | 0.278251403      | 1.055650281  | 5.683557                      | 18.52839 | 12729708. | 1.315019 | 195          |
| 22            | 0.022        | 16.76559632                  | 16.50814401                 | 0.257452304      | 1.051490461  | 5.629378                      | 18.35177 | 12608361. | 1.302483 | 627          |
| 23            | 0.023        | 16.82050313                  | 16.58292521                 | 0.237577921      | 1.047515584  | 5.578090                      | 18.18457 | 12493489. | 1.290617 | 043          |
| 24            | 0.024        | 16.87307277                  | 16.65452325                 | 0.218549518      | 1.043709904  | 5.529424                      | 18.02592 | 12384488. | 1.279356 | 898          |

|    |       |             |             |             |             |             |             |            |             |
|----|-------|-------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|
| 25 | 0.025 | 16.9234961  | 16.72319809 | 0.200298004 | 1.040059601 | 5.483143413 | 17.87504753 | 1228083169 | 1.268648798 |
| 26 | 0.026 | 16.97194152 | 16.7891791  | 0.182762423 | 1.036552485 | 5.439042958 | 17.73128004 | 1218205801 | 1.258445164 |
| 27 | 0.027 | 17.01855838 | 16.85266965 | 0.165888722 | 1.033177744 | 5.396941975 | 17.59403084 | 1208776263 | 1.248704153 |
| 28 | 0.028 | 17.06347969 | 16.91385094 | 0.149628749 | 1.02992575  | 5.356680629 | 17.46277885 | 1199758757 | 1.239388783 |
| 29 | 0.029 | 17.10682449 | 16.97288507 | 0.13393942  | 1.026787884 | 5.318117007 | 17.33706144 | 1191121497 | 1.23046622  |
| 30 | 0.03  | 17.14869969 | 17.02991765 | 0.118782036 | 1.023756407 | 5.281124568 | 17.21646609 | 1182836141 | 1.221907186 |
| 31 | 0.031 | 17.18920167 | 17.08507997 | 0.104121706 | 1.020824341 | 5.245590034 | 17.10062351 | 1174877319 | 1.213685471 |
| 32 | 0.032 | 17.22841767 | 17.1384908  | 0.089926863 | 1.017985373 | 5.21141162  | 16.98920188 | 1167222233 | 1.205777524 |
| 33 | 0.033 | 17.26642682 | 17.19025796 | 0.076168855 | 1.015233771 | 5.178497551 | 16.88190202 | 1159850328 | 1.198162113 |
| 34 | 0.034 | 17.3033012  | 17.2404796  | 0.062821595 | 1.012564319 | 5.146764814 | 16.7784533  | 115274301  | 1.190820029 |
| 35 | 0.035 | 17.3391066  | 17.28924534 | 0.049861267 | 1.009972253 | 5.116138086 | 16.67861016 | 1145883411 | 1.183733845 |

Table A9. Plot 9 Data from The SAI Supernova Catalog.

| sn_name | redshift | sn_mag | sn_type | sn_ra       | sn_dec      |
|---------|----------|--------|---------|-------------|-------------|
| 2014J   | 0.00075  | 11.4   | Ia      | 09 55 42.15 | 40 25.9     |
| 1999by  | 0.00212  | 13.1   | IaPec   | 09 21 52.07 | 00 06.5     |
| 2011by  | 0.002836 | 14.2   | Ia      | 11 55 45.56 | 19 33.8     |
| 1998bu  | 0.002974 | 11.9   | Ia      | 10 46 46.03 | 50 07.1     |
| 2006mq  | 0.003228 | 12.7   | Ia:     | 08 06 12.39 | -27 33 45.4 |
| 2001dp  | 0.003508 | 14.4   | Ia      | 11 53 45.22 | 20 56.8     |
| 2012ht  | 0.003572 | 15.9   | Ia      | 10 53 22.71 | 46 34.8     |
| 1998aq  | 0.003701 | 12.4   | Ia      | 11 56 25.81 | 07 41.6     |
| 2003cg  | 0.004133 | 14.1   |         | 10 14 15.99 | 3 28 02.1   |
| 1994ae  | 0.004274 | 13.2   | Ia      | 10 47 01.95 | 16 31.1     |
| 2002cv  | 0.004377 | 16.6   | Ia      | 10 18 03.68 | 50 06.0     |
| 2002bo  | 0.004377 | 13.8   | Ia      | 10 18 06.51 | 49 41.4     |
| 1993Z   | 0.004523 | 13.9   | Ia      | 09 10 19.60 | 7 01 40.3   |
| 2011B   | 0.004613 | 15.4   | Ia      | 08 55 48.10 | 13 01.5     |
| 1995al  | 0.005134 | 13.4   | Ia      | 09 50 55.97 | 33 09.4     |
| 2007sa  | 0.0052   | 14.2   | Ia      | 11 03 10.78 | 13 26.3     |
| 1992G   | 0.005295 | 13.6   | Ia      | 10 36 18.52 | 19 14.0     |
| 2014ad  | 0.0053   | 14.56  | IcPec:  | 11 57 44.44 | -10 10 15.7 |
| 2001fu  | 0.005653 | 15.1   | Ia      | 08 52 16.58 | -17 44 29.8 |
| 2011ae  | 0.006047 | 15.3   | Ia      | 11 54 49.25 | -16 51 43.6 |
| 2007bm  | 0.006222 | 16     | Ia      | 11 25 02.30 | -9 47 53.8  |
| 2010fz  | 0.00631  | 15.8   | Ia      | 09 42 04.77 | 0 19 51.0   |
| 1995D   | 0.006572 | 13.4   | Ia      | 09 40 54.79 | 5 08 26.6   |
| 2011eh  | 0.006741 | 14.6   | IaPec   | 11 18 31.57 | 58 36.9     |
| 2011at  | 0.006755 | 14.5   | Ia      | 09 28 57.56 | -14 48 20.6 |

|        |          |       |       |             |             |
|--------|----------|-------|-------|-------------|-------------|
| 2002hl | 0.006898 | 16.3  | Ia    | 11 24 40.12 | 46 03.0     |
| 2007ax | 0.007058 | 16.4  | Ia    | 08 22 43.26 | 33 16.9     |
| 2001bg | 0.007184 | 13.7  | Ia    | 08 35 18.86 | 28 05.8     |
| 1996Z  | 0.007595 | 14.6  | Ia    | 09 36 44.82 | -21 08 51.7 |
| 1999gh | 0.007778 | 14.7  | Ia    | 09 44 19.75 | -21 16 25.0 |
| 2005am | 0.007906 | 14    | Ia    | 09 16 12.77 | -16 18 16.2 |
| 2013cg | 0.007912 | 13.98 | Ia    | 09 26 56.77 | -24 46 59.6 |
| 2010hg | 0.008241 | 13.9  | Ia    | 09 46 13.70 | -30 27 13.3 |
| 2007cj | 0.008264 | 15.7  | Ia    | 09 59 55.76 | -29 37 03.3 |
| 2008fw | 0.008484 | 14    | Ia    | 10 28 55.97 | -44 39 55.6 |
| 1998cn | 0.008992 | 15.8  | Ia    | 11 35 54.40 | 32 10.2     |
| 2004bd | 0.009024 | 14.3  | Ia    | 11 39 42.18 | 54 31.8     |
| 2010ev | 0.009182 | 14.3  | Ia    | 10 25 29.01 | -39 49 51.0 |
| 2013eu | 0.009253 | 15.4  | Ia    | 10 24 22.31 | 36 23.5     |
| 2010hx | 0.009259 | 15.2  | Ia    | 10 28 51.06 | -35 36 22.3 |
| 2012gl | 0.009361 | 16.1  | Ia    | 10 12 50.32 | 40 56.7     |
| 2008fv | 0.009395 | 16.1  | Ia    | 10 16 57.28 | 24 36.4     |
| 1997bq | 0.009395 | 14.5  | Ia    | 10 17 05.33 | 23 02.1     |
| 2013E  | 0.00942  | 14    | Ia    | 10 00 05.54 | -34 14 01.1 |
| 2003aa | 0.010133 | 15.9  | IaPec | 10 46 36.82 | 45 32.2     |
| 1997ei | 0.010599 | 16.3  | Ic    | 11 54 59.98 | 29 26.4     |
| 2011ao | 0.010693 | 15.6  | Ia    | 11 53 51.03 | 21 46.3     |
| 2004gi | 0.010811 | 14.9  | Ia    | 10 39 23.34 | -27 54 40.0 |
| 2010Y  | 0.010865 | 15.9  | Ia    | 10 51 03.95 | 46 47.0     |
| 2012ij | 0.010997 | 16.6  | Ia    | 11 40 15.84 | 27 22.2     |
| 2014K  | 0.011625 | 16.4  | Ia    | 08 51 08.19 | 50 33.4     |
| 2009kq | 0.011693 | 16.7  | Ia    | 08 36 15.09 | 04 01.7     |
| 2007al | 0.012078 | 16.6  | IaPec | 09 59 18.48 | -19 28 25.8 |
| 2011ic | 0.012122 | 16    | Ia    | 10 15 33.21 | -20 34 06.0 |
| 2008hv | 0.012622 | 16.8  | Ia    | 09 07 34.06 | 3 23 32.1   |
| 1993C  | 0.012785 | 18    | Ia    | 09 40 23.82 | 56 11.6     |
| 2013hh | 0.012981 | 15.9  | IaPec | 11 29 04.39 | 14 09.2     |
| 2011hr | 0.01332  | 16    | IaPec | 08 54 46.03 | 32 16.1     |
| 2005as | 0.013425 | 15.9  | Ia    | 10 48 03.52 | -20 50 56.5 |
| 2008bi | 0.013445 | 15.9  | Ia    | 08 35 53.39 | 0 42 23.1   |
| 2006ou | 0.013483 | 16    | Ia    | 11 37 13.10 | 26 07.3     |
| 2001fe | 0.013545 | 14.9  | Ia    | 09 37 57.06 | 29 41.5     |
| 2013gq | 0.013772 | 15.2  | Ia    | 08 17 53.46 | 28 10.5     |
| 2007S  | 0.013883 | 16.7  | IaPec | 10 00 31.26 | 4 24 26.2   |
| 2014ao | 0.014077 | 15.3  | Ia    | 08 34 33.32 | - 2 32 36.3 |
| 1999aa | 0.014383 | 14.8  | IaPec | 08 27 42.12 | 29 15.5     |
| 2009lp | 0.015    | 16.5  | Ia    | 10 37 28.45 | -27 39 18.9 |
| 2001V  | 0.015018 | 14.5  | Ia    | 11 57 24.93 | 12 09.0     |
| 2008bc | 0.015087 | 15.2  | Ia    | 09 38 31.23 | -63 58 25.6 |
| 2013eg | 0.01521  | 17.2  | Ia    | 10 43 28.19 | -25 51 52.6 |
| 2010H  | 0.015283 | 15.2  | Ia    | 08 06 24.36 | 1 02 09.1   |
| 2013fg | 0.015341 | 15.4  | Ia    | 08 21 22.44 | -13 18 37.0 |
| 2008bt | 0.01536  | 16.5  | IbPec | 10 50 16.93 | -12 06 31.8 |
| 2001L  | 0.015452 | 15.4  | Ia    | 11 36 48.83 | - 8 35 07.0 |
| 2013H  | 0.015547 | 16.5  | Ia    | 09 06 30.70 | -75 49 01.5 |

|        |          |      |       |             |             |
|--------|----------|------|-------|-------------|-------------|
| 2010ja | 0.015555 | 17.9 | Ia    | 08 02 28.39 | 9 23 40.9   |
| 2010jq | 0.015951 | 17.1 | Ia    | 10 36 36.40 | -27 28 44.5 |
| 2001er | 0.01615  | 17.2 | Ia    | 09 53 20.66 | 50 44.8     |
| 2000ce | 0.016304 | 16.6 | Ia    | 08 05 09.45 | 47 15.2     |
| 2009U  | 0.016505 | 15.8 | IaPec | 11 43 18.72 | -12 52 46.1 |
| 2003jz | 0.016513 | 16   | Ia    | 09 46 28.67 | 45 04.7     |
| 2012gw | 0.016574 | 14.8 | Ia    | 10 10 09.14 | -38 08 05.1 |
| 2001G  | 0.016694 | 14.2 | Ia    | 09 09 33.18 | 16 51.3     |
| 2006ax | 0.016811 | 16.5 | Ia    | 11 24 03.46 | -12 17 29.2 |
| 2013gs | 0.016888 | 16.2 | Ia    | 09 31 08.83 | 23 05.3     |
| 2003Y  | 0.016932 | 16.7 | Ia    | 08 54 34.60 | 10 19.8     |
| 2014aa | 0.01695  | 15.2 | Ia    | 11 45 03.56 | 58 25.3     |
| 1999gj | 0.016968 | 17.3 | Ia    | 10 29 19.20 | 06 20.2     |
| 1991K  | 0.016998 | 18   | Ia:   | 09 20 30.47 | -16 30 01.7 |
| 2007as | 0.017095 | 15.8 | Ia    | 09 27 36.01 | -80 10 39.2 |
| 2011hd | 0.017139 | 16   | Ia    | 09 58 48.30 | 47 03.3     |
| 1999bh | 0.017198 | 16.8 | Ia    | 10 54 46.97 | 17 20.0     |
| 2006hn | 0.017198 | 15.5 | Ia    | 11 07 18.67 | 41 49.8     |
| 2002jm | 0.018012 | 17.5 | IaPec | 10 19 25.20 | - 5 39 14.5 |
| 2007ci | 0.018132 | 17.5 | Ia    | 11 45 45.85 | 46 13.9     |
| 2002au | 0.018392 | 17.3 | Ia:   | 09 34 37.57 | 5 50 15.7   |
| 1999gd | 0.018491 | 16.6 | Ia    | 08 38 24.61 | 45 33.1     |
| 2011ia | 0.019    | 15.3 | Ia    | 09 45 03.45 | 15 35.5     |
| 2009ds | 0.019204 | 15.9 | Ia    | 11 49 04.12 | - 9 43 44.9 |
| 2001E  | 0.019204 | 15.5 | Ia    | 11 49 05.00 | - 9 44 10.9 |
| 2004fw | 0.019269 | 18.3 | Ia    | 08 52 14.55 | 53 30.4     |
| 2005ki | 0.01954  | 17.7 | Ia    | 10 40 28.22 | 9 12 08.4   |
| 2009mh | 0.019739 | 16.6 | Ia    | 11 43 55.93 | 46 55.2     |
| 2003cp | 0.01977  | 16.2 | Ia    | 08 09 11.13 | 41 14.0     |
| 2008as | 0.019787 | 16.2 | Ia    | 10 21 47.89 | -19 29 42.0 |
| 2005lt | 0.019931 | 15.7 | Ia    | 11 42 26.21 | 07 05.0     |
| 2012cv | 0.02     | 16.3 | Ia    | 09 58 28.91 | -10 53 12.5 |
| 2003af | 0.02     | 15.6 | Ia    | 11 10 21.69 | 24 50.9     |
| 2003W  | 0.02007  | 16.9 | Ia    | 09 46 49.48 | 02 37.6     |
| 2013G  | 0.02068  | 15.6 | Ia    | 11 53 21.40 | 45 07.9     |
| 2001P  | 0.02068  | 17.5 | Ia    | 11 53 21.56 | 44 53.3     |
| 2006oq | 0.020734 | 15.8 | Ia    | 11 44 00.07 | 58 38.3     |
| 2007bc | 0.020818 | 16   | Ia    | 11 19 14.57 | 48 32.5     |
| 2009na | 0.020916 | 15.3 | Ia    | 10 47 01.42 | 32 38.1     |
| 2006or | 0.020963 | 16.3 | Ia    | 11 48 03.47 | 21 24.0     |
| 2001N  | 0.020974 | 16.3 | Ia    | 10 39 58.08 | 05 26.0     |
| 2008Z  | 0.020991 | 17.2 | Ia    | 09 43 15.25 | 17 03.9     |
| 2014ah | 0.021026 | 15.4 | Ia    | 11 55 30.86 | 55 26.3     |
| 2004bg | 0.021028 | 15.5 | Ia    | 11 21 01.53 | 20 23.4     |
| 2009cz | 0.021167 | 16   | Ia    | 09 15 00.02 | 44 07.1     |
| 2010iw | 0.021487 | 16.3 | IaPec | 08 45 15.01 | 49 21.8     |
| 2012cy | 0.021735 | 16.8 | Ia    | 10 55 21.80 | 7 41 50.4   |
| 2009lu | 0.021763 | 18   | Ia    | 10 54 20.96 | - 4 20 39.1 |
| 2003D  | 0.021938 | 17.5 | IaPec | 09 38 53.52 | - 4 51 05.1 |
| 2008ia | 0.022    | 15.1 | Ia    | 08 50 35.15 | -61 16 40.6 |

|        |          |       |        |             |             |
|--------|----------|-------|--------|-------------|-------------|
| 2009al | 0.022086 | 15.8  | Ia     | 10 51 22.08 | 8 34 42.4   |
| 2014ae | 0.022225 | 15.2  | Ia     | 11 19 20.95 | 48 57.3     |
| 2004at | 0.022335 | 17.2  | Ia     | 10 58 45.18 | 29 12.0     |
| 2006ar | 0.022478 | 18.2  | Ia     | 10 37 30.75 | 00 58.1     |
| 2003ag | 0.022851 | 16.1  | Ia     | 11 26 01.82 | 1 59 02.8   |
| 2014ai | 0.022902 | 17.23 | Ia     | 09 19 44.19 | 45 49.5     |
| 2002hv | 0.023367 | 18.6  | Ia     | 09 22 10.91 | 50 10.8     |
| 2014ap | 0.023516 | 15.7  | Ia     | 11 30 13.28 | 10 06.2     |
| 2004av | 0.023641 | 15.8  | Ia     | 11 40 57.84 | -22 28 53.6 |
| 2003ik | 0.023733 | 16.6  | Ia     | 08 04 06.52 | 59 19.8     |
| 1996V  | 0.023789 | 16.5  | Ia     | 11 21 31.23 | 2 48 40.4   |
| 1994K  | 0.023833 | 17.5  | Ia     | 10 00 24.61 | 52 31.7     |
| 2004bc | 0.023916 | 16.5  | Ia     | 10 59 31.41 | 11 28.9     |
| 2004ap | 0.023939 | 16.5  | Ia     | 10 05 43.81 | 16 17.1     |
| 2013C  | 0.023956 | 16.7  | Ia     | 11 05 55.24 | 31 20.3     |
| 2007kd | 0.024183 | 16.3  | Ia     | 09 25 58.01 | 37 59.3     |
| 2002bf | 0.024396 | 16.6  | Ia     | 10 15 42.31 | 40 06.7     |
| 2013P  | 0.02454  | 16.7  | Ia     | 09 13 37.17 | 59 58.6     |
| 2005M  | 0.024552 | 18.2  | Ia     | 09 37 32.36 | 12 02.7     |
| 2002he | 0.024563 | 16.1  | IaPec: | 08 19 58.83 | 49 13.2     |
| 2012hj | 0.024597 | 17.7  | Ia     | 11 07 19.23 | 22 46.1     |
| 2011C  | 0.024757 | 15.4  | Ia     | 11 17 54.88 | - 2 05 45.2 |
| 2006bb | 0.024983 | 17.3  | Ia     | 08 33 31.09 | 31 04.1     |
| 2010jn | 0.025052 | 16.9  | Ia     | 09 37 30.26 | 09 33.4     |
| 1999X  | 0.025084 | 16.3  | Ia     | 08 54 32.23 | 30 41.1     |
| 2009P  | 0.02513  | 16.1  | IaPec  | 11 20 38.78 | - 3 32 46.3 |
| 2014R  | 0.025148 | 17.7  | Ia     | 09 30 12.30 | 51 13.4     |
| 2005ms | 0.025204 | 17.1  | Ia     | 08 49 14.34 | 07 47.9     |
| 2005mc | 0.025236 | 16.5  | Ia     | 08 27 06.36 | 38 45.6     |
| 2008gf | 0.025441 | 16.7  | II     | 09 44 31.40 | 45 31.1     |
| 2013ah | 0.025441 | 18.6  | Ia     | 09 44 33.89 | 45 44.1     |
| 2003eh | 0.025514 | 17.6  | Ia     | 11 08 24.34 | 3 29 47.0   |
| 2013N  | 0.025558 | 15.9  | Ia     | 11 50 04.13 | 16 46.0     |
| 2001gb | 0.025731 | 16.8  | Ia     | 09 59 00.96 | 49 12.4     |
| 2013hl | 0.026128 | 16.9  | Ia     | 11 50 00.17 | 20 17.2     |
| 2010lq | 0.026366 | 15.2  | Ia     | 08 32 41.03 | -24 02 46.2 |
| 2004gs | 0.026645 | 17.1  | Ia     | 08 38 23.18 | 37 39.8     |
| 2013V  | 0.026762 | 17.5  | Ia     | 09 08 41.54 | 48 49.2     |
| 2008hp | 0.027    | 16.4  | Ia     | 09 43 26.22 | 10 21.9     |
| 2002bn | 0.027241 | 16.3  | Ia     | 11 32 39.04 | 56 54.2     |
| 2009mx | 0.027245 | 18.1  | IaPec  | 09 20 37.72 | 38 52.9     |
| 1999at | 0.027298 | 18.8  | Ia     | 10 23 11.30 | 59 06.0     |
| 1993D  | 0.027318 | 18    | Ia     | 11 28 58.81 | -22 29 06.2 |
| 2003bt | 0.027515 | 16.7  | Ia     | 10 55 22.48 | - 7 39 12.3 |
| 2009aa | 0.027732 | 17.4  | Ia     | 11 23 42.28 | -22 16 14.5 |
| 2005km | 0.027789 | 17.3  | Ia     | 11 20 48.72 | 17 25.2     |
| 2012cm | 0.028202 | 16.5  | Ia     | 09 10 05.45 | 12 45.1     |
| 2013gb | 0.028289 | 16.1  | Ia     | 08 58 52.50 | 34 59.9     |
| 2005F  | 0.028573 | 17.7  | Ia     | 09 04 53.68 | 33 56.3     |
| 2004az | 0.028824 | 17.8  | Ia     | 11 52 48.22 | 20 51.7     |

|        |          |      |       |             |             |
|--------|----------|------|-------|-------------|-------------|
| 2004ck | 0.029266 | 19.8 | Ia    | 10 14 35.20 | 52 05.7     |
| 2001ba | 0.02956  | 15.9 | Ia    | 11 38 01.76 | -32 19 51.0 |
| 2006qo | 0.029703 | 18.5 | Ia:   | 08 00 08.37 | 22 07.7     |
| 2007uz | 0.029743 | 18   | Ia    | 11 20 51.63 | -29 24 16.5 |
| 1997bz | 0.029847 | 17.5 | Ia    | 11 22 25.46 | 1 11 21.5   |
| 2004bp | 0.029962 | 18   | Ia    | 11 09 53.25 | 00 06.4     |
| 2003ap | 0.03     | 16.7 | Ia    | 09 50 52.83 | -21 51 10.1 |
| 2011J  | 0.03     | 18.8 | Ia    | 10 50 44.20 | 00 49.0     |
| 2013ao | 0.03     | 17   | Ia    | 11 44 44.74 | -20 31 41.1 |
| 2008ae | 0.030083 | 17.8 | IaPec | 09 56 03.20 | 29 58.8     |
| 2002ar | 0.030094 | 16.5 | Ia    | 11 37 43.92 | 00 34.4     |
| 2008bd | 0.030104 | 16.7 | Ia    | 10 18 23.32 | -13 06 11.2 |
| 2007V  | 0.030327 | 16.7 | Ia    | 10 27 05.58 | - 3 18 05.1 |
| 2001ie | 0.030787 | 16.1 | Ia    | 10 16 50.70 | 16 44.5     |
| 2007ux | 0.030915 | 15.7 | Ia    | 10 09 19.98 | 59 32.8     |
| 2007bd | 0.031018 | 17.6 | Ia    | 08 31 33.28 | - 1 11 58.0 |
| 2004as | 0.031021 | 17.2 | Ia    | 11 25 39.18 | 49 49.4     |
| 2006te | 0.031545 | 15.8 | Ia    | 08 11 42.99 | 33 16.8     |
| 2011ho | 0.031832 | 18.3 | Ia    | 11 44 12.95 | 30 58.1     |
| 2003ae | 0.031998 | 17.1 | Ia    | 09 28 22.58 | 26 40.7     |
| 1999am | 0.032062 | 17.8 | Ia    | 08 24 10.88 | 06 58.6     |
| 2004H  | 0.032065 | 17.6 | Ia    | 11 33 59.77 | 03 46.5     |
| 2004L  | 0.032253 | 16.8 | Ia    | 10 27 04.11 | 01 07.3     |
| 2011bg | 0.03226  | 16.3 | IaPec | 11 56 14.31 | 21 11.9     |
| 2012ce | 0.032939 | 16.6 | Ia    | 11 13 49.46 | -29 55 32.0 |
| 2003kc | 0.033166 | 18.1 | Ia    | 09 46 34.32 | 39 19.0     |
| 2003cq | 0.033209 | 17   | Ia    | 11 56 14.16 | 31 19.3     |
| 2012if | 0.033357 | 18.2 | Ia    | 11 17 30.29 | 24 07.4     |
| 2003bf | 0.033583 | 17.2 | Ia    | 08 08 26.35 | 19 56.2     |
| 2011be | 0.033957 | 17.1 | Ia    | 09 22 52.62 | 59 15.7     |
| 2008E  | 0.034    | 18   | Ia    | 11 25 36.95 | 08 25.9     |
| 2002br | 0.034183 | 17   | Ia    | 10 34 08.92 | 42 20.9     |
| 2008cz | 0.034233 | 18.1 | Ia    | 11 23 10.90 | 12 51.0     |
| 2013U  | 0.034527 | 16.6 | IaPec | 10 01 12.00 | 0 19 42.3   |
| 2009ee | 0.034895 | 17.3 | Ia    | 11 21 25.30 | 20 23.3     |
| 2002hd | 0.035    | 18   | Ia    | 08 54 03.39 | - 7 11 21.5 |
| 2008at | 0.035    | 16.5 | Ia    | 10 27 12.35 | 24 56.4     |
| 2007qc | 0.035    | 16.8 | Ia    | 11 57 04.75 | 29 55.3     |

Table A10. Plot 10 Data from The SAI Supernova Catalog.

| sn_name | redshift | sn_mag | sn_type | sn_ra       | sn_dec      |
|---------|----------|--------|---------|-------------|-------------|
| 2013dy  | 0.003874 | 16.3   | Ia      | 22 18 17.60 | 34 09.5     |
| 2008ha  | 0.004658 | 18.2   | IaPec   | 23 34 52.69 | 13 35.4     |
| 2000E   | 0.00475  | 13.8   | Ia      | 20 37 13.77 | 05 50.2     |
| 2011dm  | 0.004917 | 16.5   | Ia      | 21 56 41.59 | 17 48.9     |
| 2014ck  | 0.005116 | 16.1   | IaPec   | 22 45 38.77 | 09 43.1     |
| 2014ba  | 0.00584  | 14.7   | IaPec   | 22 55 01.97 | -39 39 34.5 |
| 1993L   | 0.006417 | 14     | Ia      | 22 57 52.87 | -35 51 27.0 |
| 2007kg  | 0.006671 | 17.17  | Ia      | 23 58 37.43 | 59 06.7     |

|        |          |      |       |             |             |
|--------|----------|------|-------|-------------|-------------|
| 2007le | 0.006724 | 14.9 | Ia    | 23 38 48.41 | - 6 31 21.3 |
| 1997dt | 0.007312 | 15.3 | Ia    | 23 00 02.93 | 58 50.9     |
| 2005dc | 0.007391 | 15.7 | Ia    | 21 42 22.66 | -44 47 21.2 |
| 2010bv | 0.008652 | 15.4 | Ia    | 22 14 01.90 | -26 55 44.5 |
| 2013gh | 0.008789 | 15.9 | Ia    | 22 02 21.85 | -18 55 00.4 |
| 2004eq | 0.008832 | 13.4 | Ia    | 21 57 09.46 | -34 34 51.3 |
| 1998dh | 0.008936 | 13.9 | Ia    | 23 14 40.31 | 4 32 14.1   |
| 2004fu | 0.009215 | 16.5 | Ia    | 20 35 11.58 | 48 26.1     |
| 2002ge | 0.010013 | 14.1 | Ia    | 22 54 21.49 | -45 20 26.9 |
| 2012dn | 0.01018  | 16.3 | Ia    | 20 23 36.26 | -28 16 43.4 |
| 2002cd | 0.01034  | 16.4 | Ia    | 20 23 34.42 | 20 47.4     |
| 2008cc | 0.010453 | 16   | Ia    | 21 03 29.62 | -67 11 01.1 |
| 2004bv | 0.010515 | 15.3 | Ia    | 20 25 06.34 | -24 48 53.7 |
| 2006bh | 0.010834 | 14.6 | Ia    | 22 40 16.10 | -66 29 06.3 |
| 2004db | 0.011177 | 17.7 | Ia    | 22 47 55.88 | -22 19 40.6 |
| 1999ee | 0.011406 | 14.6 | Ia    | 22 16 10.00 | -36 50 39.7 |
| 2002dp | 0.011634 | 15.1 | Ia    | 23 28 30.12 | 25 38.8     |
| 2012ah | 0.012271 | 14.8 | Ia    | 23 25 59.63 | -81 54 33.3 |
| 2003dt | 0.014088 | 17.5 | Ia    | 20 47 17.56 | 0 18 42.8   |
| 2002ha | 0.014088 | 14.5 | Ia    | 20 47 18.58 | 0 18 45.6   |
| 1991ag | 0.014223 | 14.7 | Ia    | 20 00 08.63 | -55 22 03.3 |
| 2007hj | 0.014252 | 15.7 | Ia    | 23 01 47.89 | 35 11.4     |
| 2008ea | 0.014511 | 17.5 | II    | 23 20 22.60 | 19 10.6     |
| 2014ci | 0.014526 | 16.3 | Ia    | 22 34 04.53 | 26 25.4     |
| 2012fz | 0.014596 | 14.5 | Ia    | 20 03 24.84 | -55 57 19.2 |
| 1992al | 0.0146   | 14.6 | Ia    | 20 45 56.45 | -51 23 40.0 |
| 2012gm | 0.014786 | 15.9 | Ia    | 23 17 37.05 | 00 08.8     |
| 2014cg | 0.014913 | 17.8 | Ia    | 20 04 34.84 | 44 16.8     |
| 2002jg | 0.014987 | 15.8 | Ia    | 22 19 28.80 | 23 04.5     |
| 2005kc | 0.015138 | 18   | Ia    | 22 34 07.34 | 5 34 06.3   |
| 2013fa | 0.015513 | 15.6 | Ia    | 20 43 53.56 | 30 52.0     |
| 2009nq | 0.015626 | 15.2 | Ia    | 23 15 16.97 | 01 22.5     |
| 2003gt | 0.015657 | 16.4 | Ia    | 20 32 59.12 | 9 52 19.3   |
| 2013ga | 0.015684 | 15.7 | Ia    | 22 04 21.56 | 44 33.6     |
| 2004eo | 0.015701 | 16.2 | Ia    | 20 32 54.19 | 9 55 42.7   |
| 2003ep | 0.015705 | 15.7 | Ia    | 21 21 07.34 | 05 05.8     |
| 2012ig | 0.015737 | 16.2 | Ia    | 21 14 22.85 | 14 40.4     |
| 2004ey | 0.015844 | 16   | Ia    | 21 49 07.81 | 0 26 39.2   |
| 2004da | 0.016031 | 15.2 | IaPec | 20 22 21.24 | 6 25 50.3   |
| 1990R  | 0.016051 | 17.5 | Ia    | 21 12 20.90 | 36 37.0     |
| 2009fk | 0.016181 | 18.5 | Ia    | 22 44 23.90 | - 0 09 42.0 |
| 2011im | 0.016181 | 16.9 | Ia    | 22 44 25.21 | - 0 10 02.0 |
| 2002dl | 0.016261 | 17.7 | IaPec | 22 20 53.96 | 17 33.7     |
| 2006cm | 0.016335 | 16.6 | IaPec | 21 20 17.46 | - 1 41 02.7 |
| 2006B  | 0.016357 | 16.5 | Ia    | 23 21 09.78 | 24 01.2     |
| 1996ca | 0.016365 | 16.5 | Ia    | 22 30 59.26 | -13 59 50.9 |
| 2008ec | 0.016382 | 17.3 | Ia    | 23 03 16.56 | 8 52 19.8   |
| 2009jr | 0.016548 | 16   | Ia    | 20 26 26.03 | 2 54 32.1   |
| 2013fw | 0.016957 | 16.2 | Ia    | 21 13 44.78 | 34 33.3     |
| 2001da | 0.017195 | 16.3 | Ia    | 23 53 32.78 | 8 07 02.6   |

|        |          |      |       |             |             |
|--------|----------|------|-------|-------------|-------------|
| 2006ch | 0.017244 | 16.6 | Ia    | 23 47 06.12 | 28 50.6     |
| 2013Q  | 0.017244 | 15.6 | Ia    | 23 47 07.84 | 29 11.5     |
| 2007fs | 0.017306 | 15.3 | Ia    | 22 01 40.44 | -21 30 29.6 |
| 2013ei | 0.017407 | 16   | Ia    | 21 26 31.93 | 10 49.4     |
| 2007cs | 0.017558 | 15.9 | Ia    | 23 49 39.00 | 55 52.1     |
| 2004ca | 0.017805 | 18   | Ia    | 21 43 32.84 | 41 33.0     |
| 2003gl | 0.017936 | 18.2 | Ia    | 23 53 53.99 | 7 57 23.7   |
| 2010im | 0.018    | 16.3 | Ia    | 20 11 31.59 | -45 41 57.8 |
| 2007fb | 0.018012 | 15.6 | Ia    | 23 56 52.37 | 5 30 31.8   |
| 2012co | 0.018199 | 17.2 | Ia    | 21 44 08.52 | 14 50.9     |
| 1998co | 0.018205 | 16   | Ia    | 21 47 36.24 | -13 10 52.3 |
| 2009hk | 0.018346 | 16.9 | Ia    | 20 38 37.42 | -25 06 56.0 |
| 2006bn | 0.018516 | 18.4 | Ia    | 20 00 15.75 | -38 34 18.3 |
| 2012fw | 0.018586 | 15.3 | Ia    | 21 01 58.98 | -48 16 26.4 |
| 2001iq | 0.018599 | 16.6 | Ia    | 22 25 10.42 | 43 04.2     |
| 2012gb | 0.018633 | 16.4 | IaPec | 22 15 42.78 | 14 37.7     |
| 2012bl | 0.018702 | 15.4 | Ia    | 20 23 55.28 | -48 21 17.3 |
| 2011gu | 0.019033 | 16.9 | IaPec | 23 06 02.81 | 06 36.3     |
| 2008ff | 0.019193 | 15.5 | Ia    | 20 13 59.96 | -44 21 07.8 |
| 2004fa | 0.019363 | 16.8 | Ia    | 20 22 35.00 | -29 49 20.7 |
| 2001ib | 0.019616 | 15.3 | Ia    | 22 15 38.58 | 17 56.0     |
| 2001dd | 0.019686 | 16.4 | Ia    | 20 30 54.08 | - 0 39 26.9 |
| 2013hq | 0.019933 | 16.3 | Ia    | 22 24 13.19 | 05 00.7     |
| 2000ey | 0.020407 | 15.4 | Ia    | 23 19 25.20 | 5 54 21.1   |
| 2011fs | 0.021026 | 15.8 | Ia    | 22 17 19.52 | 34 49.9     |
| 2007B  | 0.021097 | 16.7 | Ia    | 22 35 31.10 | 48 06.6     |
| 2001dl | 0.021167 | 16.1 | Ia    | 21 21 01.73 | 9 10 50.4   |
| 2003gq | 0.021439 | 17.5 | IaPec | 22 53 20.71 | 07 57.6     |
| 2002dr | 0.021931 | 17   | Ia    | 22 51 01.00 | 22 23.0     |
| 1999do | 0.021932 | 14.9 | Ia    | 22 53 29.87 | 38 42.9     |
| 2013em | 0.022005 | 15.7 | Ia    | 23 02 26.64 | 31 31.3     |
| 2009gg | 0.022015 | 15.8 | Ia    | 21 01 29.91 | -52 01 00.2 |
| 2006dm | 0.02214  | 16.9 | Ia    | 23 41 47.84 | - 3 40 08.4 |
| 2010ex | 0.022809 | 15.8 | Ia    | 23 00 10.90 | 05 57.2     |
| 2011ff | 0.023272 | 16.8 | Ia    | 22 45 02.88 | 00 15.7     |
| 2002el | 0.023299 | 17   | Ia    | 20 56 30.09 | -18 33 34.3 |
| 2006eu | 0.023586 | 17.2 | Ia    | 20 02 51.15 | 19 02.3     |
| 2002ef | 0.023624 | 16.2 | Ia    | 23 51 29.54 | -13 22 46.4 |
| 2009in | 0.023673 | 16.3 | IaPec | 23 22 35.32 | -13 05 43.6 |
| 2002dx | 0.023677 | 18.8 | Ia    | 23 57 06.73 | 50 15.5     |
| 2013di | 0.023813 | 16.6 | Ia    | 22 36 27.53 | 36 54.6     |
| 2000fo | 0.023849 | 16.5 | Ia    | 22 58 25.34 | 38 26.6     |
| 2007qe | 0.024    | 17   | Ia    | 23 54 12.98 | 24 33.4     |
| 2013dt | 0.024132 | 16.7 | Ia    | 22 44 35.45 | 3 38 37.2   |
| 1998eg | 0.024757 | 15.5 | Ia    | 22 39 30.32 | 8 36 20.8   |
| 2012et | 0.024965 | 16.6 | Ia    | 23 42 38.88 | 05 31.1     |
| 2002dm | 0.025174 | 19.6 | Ia    | 20 32 07.30 | -57 35 03.4 |
| 2008ct | 0.025316 | 19   | Ia:   | 22 02 24.48 | 19 21.4     |
| 2005di | 0.025318 | 18.3 | Ia    | 22 25 32.84 | -24 14 20.1 |
| 2003he | 0.025514 | 18.1 | Ia    | 23 58 57.05 | - 2 14 53.1 |

|        |          |      |       |             |             |
|--------|----------|------|-------|-------------|-------------|
| 2003gr | 0.025654 | 16.3 | Ia    | 23 38 12.67 | -20 46 56.0 |
| 2005er | 0.02591  | 18.4 | IaPec | 22 50 00.84 | 37 05.7     |
| 2007cq | 0.025917 | 15.8 | Ia    | 22 14 40.43 | 5 04 48.9   |
| 2003kg | 0.025979 | 16.6 | Ia    | 22 03 34.64 | 06 10.6     |
| 2010ii | 0.026928 | 18   | Ia    | 22 38 13.18 | 29 30.0     |
| 2012ee | 0.027125 | 15.4 | Ia    | 20 45 15.28 | - 5 37 22.1 |
| 2013fn | 0.027132 | 17.3 | Ia    | 21 00 23.74 | -14 29 52.0 |
| 2002et | 0.027432 | 16.5 | Ia    | 20 08 31.02 | -25 27 37.5 |
| 2010cq | 0.027472 | 16.4 | Ia    | 21 01 44.10 | -14 38 30.5 |
| 2002eb | 0.027539 | 17.6 | Ia    | 22 19 05.24 | 35 39.8     |
| 2011gf | 0.027655 | 16.1 | Ia    | 21 12 24.27 | - 7 48 52.1 |
| 2007su | 0.027862 | 16.9 | Ia    | 22 19 08.88 | 10 40.3     |
| 2013hp | 0.027935 | 17.4 | Ia    | 23 13 59.72 | 53 38.6     |
| 2013ey | 0.027942 | 15.9 | Ia    | 20 58 03.73 | 03 10.6     |
| 2009fw | 0.028272 | 16.1 | Ia    | 20 32 18.50 | -19 43 59.6 |
| 2006do | 0.028426 | 16.7 | Ia    | 23 32 03.08 | -27 43 31.8 |
| 2012eo | 0.028546 | 17.2 | Ia    | 22 14 37.82 | 57 18.4     |
| 2002df | 0.028679 | 17.1 | Ia    | 20 45 39.33 | - 4 57 04.7 |
| 2006ev | 0.028728 | 16.6 | Ia    | 21 30 59.26 | 59 21.2     |
| 2008cv | 0.02876  | 17   | Ia    | 21 04 55.31 | -21 43 49.5 |
| 2000A  | 0.028899 | 15.5 | Ia    | 23 27 58.90 | 8 47 02.1   |
| 1992bb | 0.028913 | 17.5 | Ia    | 21 18 14.86 | - 7 35 03.5 |
| 1993ah | 0.029285 | 16.3 | Ia:   | 23 51 50.27 | -27 57 47.0 |
| 2011hb | 0.029522 | 17.3 | Ia    | 23 27 55.51 | 8 46 45.7   |
| 2001dt | 0.029757 | 18.2 | Ia    | 23 22 19.17 | 09 25.3     |
| 2007oo | 0.029757 | 18.8 | Ia    | 23 22 19.50 | 09 20.0     |
| 2011hv | 0.029813 | 17.4 | Ia    | 23 18 16.55 | 0 15 43.1   |
| 2007dz | 0.03     | 17.9 | Ia    | 21 45 16.26 | 02 48.6     |
| 2010hj | 0.03     | 17.1 | Ia    | 21 49 09.84 | -59 02 23.2 |
| 2012go | 0.03     | 16.5 | Ia    | 22 41 51.81 | 58 07.0     |
| 2006rb | 0.03     | 17.7 | Ia    | 23 35 25.09 | 7 06 46.4   |
| 2007rx | 0.03     | 17.2 | Ia    | 23 40 11.74 | 25 16.5     |
| 1991bf | 0.030091 | 17.5 | Ia    | 23 52 15.36 | -29 26 29.2 |
| 2004fg | 0.030132 | 18.2 | Ia    | 23 47 24.45 | 23 22.4     |
| 2000cw | 0.030132 | 17.2 | Ia    | 23 47 25.10 | 23 15.8     |
| 2010dl | 0.0302   | 16.4 | Ia    | 21 35 00.97 | - 0 30 47.8 |
| 2000ej | 0.030361 | 18   | Ia    | 21 20 15.66 | - 4 52 40.5 |
| 2005mu | 0.030401 | 17.4 | Ia    | 21 35 52.50 | -26 27 03.5 |
| 2006ha | 0.03047  | 18.4 | Ia    | 22 58 34.30 | 10 25.8     |
| 2013fy | 0.030958 | 15.5 | Ia    | 21 37 27.13 | -47 01 55.6 |
| 2004ef | 0.030974 | 17.5 | Ia    | 22 42 10.00 | 59 40.3     |
| 2005cg | 0.030988 | 17.7 | Ia    | 21 10 50.42 | 0 12 07.4   |
| 2011ie | 0.031    | 16.7 | Ia    | 23 00 54.71 | 50 32.3     |
| 2011L  | 0.031    | 17   | Ia    | 23 40 11.52 | 25 42.2     |
| 2001de | 0.031064 | 17.2 | Ia    | 22 34 18.06 | 24 54.7     |
| 2001fg | 0.031101 | 17.9 | Ia    | 21 12 45.23 | - 0 52 36.2 |
| 2013cy | 0.031465 | 16.8 | Ia    | 22 10 34.23 | -22 39 47.8 |
| 2006en | 0.031938 | 15.2 | Ia    | 23 10 05.06 | 13 24.0     |
| 2014at | 0.031982 | 16.4 | Ia    | 21 46 14.82 | -46 31 21.1 |
| 2000dn | 0.032065 | 17.3 | Ia    | 23 05 05.86 | - 3 12 01.0 |

|        |          |      |     |             |             |
|--------|----------|------|-----|-------------|-------------|
| 1990ab | 0.032829 | 18   | Ia  | 21 54 04.01 | -40 04 16.1 |
| 2006dv | 0.032999 | 17.5 | Ia  | 23 15 53.06 | 5 07 50.2   |
| 2013fj | 0.033453 | 16.7 | Ia  | 22 15 28.48 | 34 03.6     |
| 2007ob | 0.033926 | 17   | Ia  | 23 12 25.99 | 54 49.3     |
| 2011hc | 0.034    | 16.4 | Ia  | 20 12 10.07 | -11 21 57.7 |
| 1997dg | 0.034    | 16.4 | Ia  | 23 40 14.21 | 12 11.8     |
| 2005iq | 0.034043 | 17   | Ia  | 23 58 32.50 | -18 42 33.0 |
| 2006op | 0.03409  | 21.6 | Ia: | 21 21 31.86 | 0 59 35.9   |
| 2004bz | 0.034168 | 18.3 | Ia  | 22 15 01.05 | 24 16.6     |
| 2003gj | 0.034335 | 17.6 | Ia  | 21 07 19.18 | -25 29 23.6 |
| 2010ij | 0.03441  | 15.9 | Ia  | 22 20 20.19 | 03 22.2     |
| 2003gn | 0.034451 | 18.1 | Ia  | 22 33 51.68 | 48 08.5     |
| 2006gr | 0.034597 | 18.3 | Ia  | 22 32 22.67 | 49 43.3     |

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