Rest Frame i-band Survey for SNIa z $\sim$ 1.2

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The rest frame Y-band survey for the SNIa is constrained by the maximum redshift that can be observed due to the observer frame filter in which the light will be emitted. it is also constrained by the limiting magnitude in the YJH bands. The aim of this investigation was to look at the contribution of a high-z arm from SNe measured in the i-band

1 Motivation

Laureijs et al. 2012 present a case for a rest-frame i-band SN survey, where they say they will discover 3000 out to z $\sim$ 1.2.

The argument was based on the efforts of Freedman et al to get data out to z $\sim$ 0.7 and have a small error budget despite only 35 SNe in their sample. They demonstrate that the scatter is significantly lesser in their i band measurements compare to the B-band

2 Current Design

The aim of this investigation was to look at the impact of a high-z arm extending out to $z \sim 1.2$ on decreasing the expanse of the contours for w_0-w_a. We ran 200 simulations for the z range between 1 and 1.2 from an i-band template light curve. using an input cosmology, we convert these into luminosity distances (after normalising the peak magnitudes.)

3 Method

A template light curve was created using the same procedure as for the YJH bands. The mean scatter was higher than at longer wavelengths (as expected from the distribution of M_i for the CSP SNe). From the template curve, we generate a few hundred realisations with redshifts between 1 and 1.2.

We fit the realisations using SNooPy's i-band template fitter. The final input to the cosmology is the absolute magnitude, redshift and error on the fit.

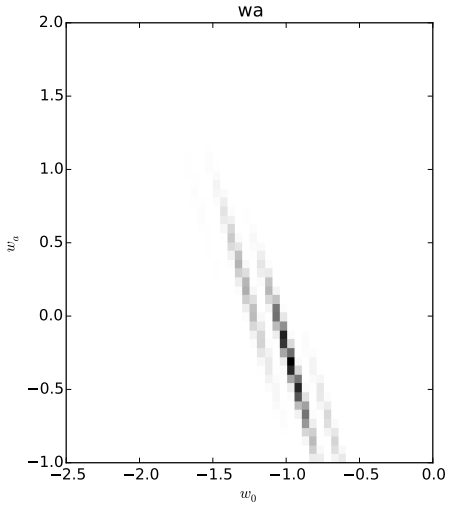

Figure 1: w_a-w_0 contours from the rest frame infrared survey with the high redshift arm measured in the i-band

4 Comparison

In this section, we compare the results for the w_0-w_a contours from Union 2.1 distance moduli with the values from the rest frame IR survey. The contours are calculated from a χ^2 minimisation

We find from the figures that there is a significant improvement in the w_0-w_a contours using SNe only from the IR, compared to the Union 2.1 estimates.

from the Union 2.1 paper, using their CMB+BAO+SNe constraints they obtain a w_a of $0.14 + 0.60 - 0.76$

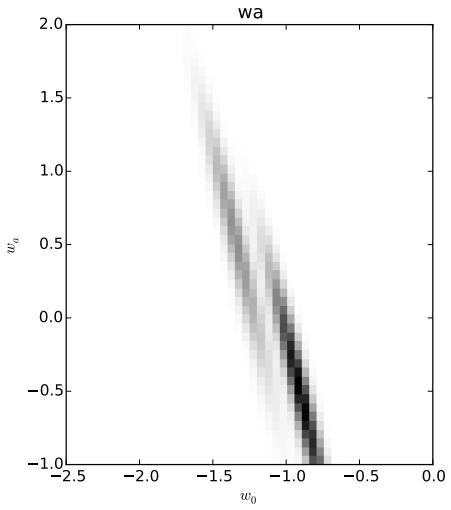

Figure 2: Same as above for Union 2.1