The Ground-based IR Data of 2001

Chris Lidman
for The Supernova Cosmology Project

July 19, 2004

The data set

During 2001, we observed 4 SNe Ia with ground-based IR instruments. The aim of the observations were to obtain a single lightcurve point in the rest-frame V-band (I band) for SNe Ia at $z \sim 1.1$ ($z \sim 0.5$).

Table 1: NIRI and ISAAC Observations

IAU Name	Redshift	Instrument/Telescope	Filter	Comments
SN 2001gn	1.12	ISAAC/VLT-UT1	Js	Good. Reference taken
SN 2001go	0.552	ISAAC/VLT-UT1	Js	Too shallow.
SN 2001gq	0.671	ISAAC/VLT-UT1	Js	Poor seeing.
SN 2001hb	1.05	ISAAC/VLT-UT1 and	Js	Good. Hostless
		NIRI/Gemini North	J	Good. Hostless

All the data are fully reduced. The data on SN 2001gn and SN 2001hb are excellent. The SNe are clearly detected and the measured magnitudes have errors of 10%. The data on SN 2001go and SN 2001gq are relatively poor. The data on SN 2001go are too shallow - it was abandoned to do SN 2001hb - and the observations of SN 2001gq were taken when the seeing was relatively poor. The data on these two SNe Ia are not going to be useful and are not considered further.

Analysis steps

- Reduce data - complete
- Determine fluxes - complete
- k corrections - complete (Serena I templates)
- Light curve fitting - done for SN 2001gn (Used Juliean's optical photometry and Rob's UBV lightcurves)
- Cosmology - See the attached plot.

Discussion points.

- Verify Juliean's HST photometry.
- Use Serena II templates for the k-corrections.
- Use a revised set of UBV lightcurves.
- 2002 IR data - 3 $z > 1$ SNe. The data are fully reduced. Waiting for the analysis of the HST data.

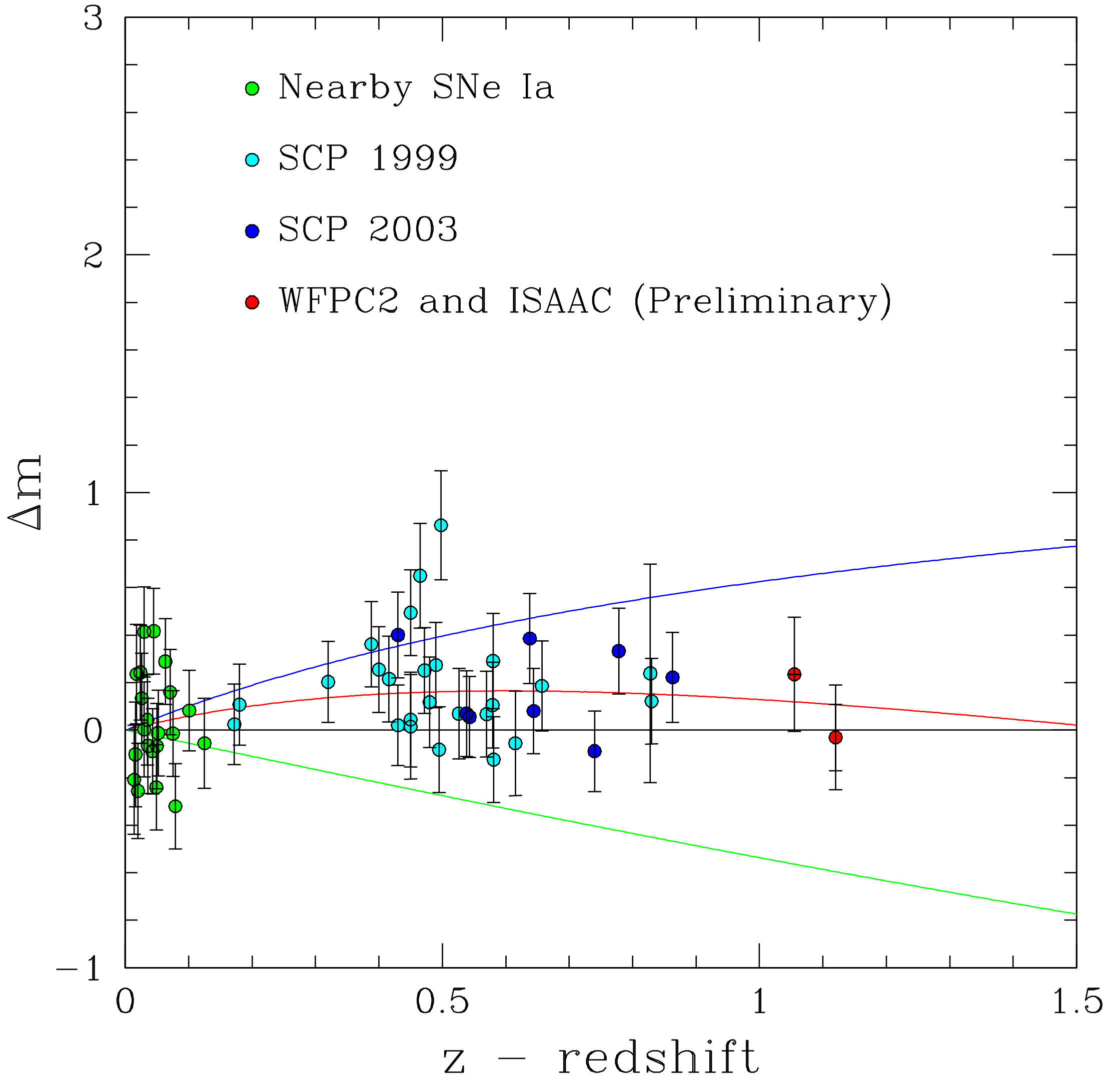

Figure 1: The differential B-band Hubble diagram with SNe Ia from Knop et al. (2003) and from the analysis of data that were collected on SNe 2001hb and 2001gn. In this diagram, an empty universe, which neither accelerates nor decelerates, is a horizontal line at zero. A flat universe consisting entirely of dark energy and a flat universe consisting entirely of matter are represented by the blue and green lines respectively. The red line represents the concordance model.
.