

Abstract Submitted
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Improving Cosmology Measurements with Type Ia Supernova Spectral Time Series GREG ALDERING, Lawrence Berkeley National Laboratory, NEARBY SUPERNOVA FACTORY COLLABORATION — Type Ia supernovae (SNe Ia) continue to be a leading probe for cosmology - able to measure the dark energy equation of state, growth of structure, and the Hubble constant. A limitation to their accuracy is that the standardization methods are empirical, with residual unexplained dispersion that leaves open the door for differences in dust extinction or progenitor properties that can be confused with cosmology parameters. The seriousness of this issue is illustrated by the correlations with SN host galaxy properties that remain after the application of current standardization methods. The sample of spectrophotometric time series of nearby SNe Ia obtained by the Nearby Supernova Factory has proven able to address a number of these issues. We will present new cosmology constraints based on this dataset, and discuss several new insights and results that can make SNe Ia an even more powerful probe. In particular, we find that the unexplained dispersion can be cut in half, and that the residual correlations of SN luminosity with host galaxy properties are greatly reduced, by locating SNe Ia in a 3D non-linear space. We also demonstrate the ability to obtain excellent flux calibration (to 0.5 percent RMS). These insights will be invaluable for on-going and upcoming SN cosmology surveys.

Greg Aldering
Lawrence Berkeley National Laboratory

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