

N50c Probing the Progenitor Metallicity of SNe Ia with Ultraviolet Spectra

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Ultraviolet (UV) observations of Type Ia supernovae (SNe Ia) are useful tools for understanding progenitor systems and explosion physics. In particular, UV spectra of SNe Ia, which probe the outermost layers, are strongly affected by the progenitor metallicity. Theory suggests that SN Ia progenitor metallicity is correlated with its peak luminosity, but not its light-curve shape. This effect should lead to an increased Hubble scatter, reducing the precision with which we measure distances. If the mean progenitor metallicity changes with redshift, cosmological measurements could be biased. Models also indicate that changing progenitor metallicity will have little effect on the appearance of optical SN data, but significantly alter UV spectra. Here we use the largest UV spectroscopic sample of SNe Ia to date to study the metallicity effect. With this sample, we confirm theoretical predictions that SN Ia UV spectra are strong metallicity indicators. Our findings show that UV spectra are promising tools to further our understanding of SN Ia while directly improving the utility of SN Ia for cosmology.