

ORAL CONTRIBUTION

SPECTRAL DIVERSITY OF TYPE II SUPERNOVAE: CHARACTERIZATION AND CORRELATIONS

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We present a spectroscopic and photometric analysis of type II Supernovae (SNe) obtained by the Carnegie Supernova Project (CSP) plus previous campaigns between 1986 and 2009. A total of 124 SNe with 900 spectra were analyzed. The expansion velocity of the ejecta in the photospheric phase, the pseudo-equivalent width of 11 features, the ratio of absorption to emission of H α and the velocity decline rate of H β were analysed and correlated with photometric parameters. We find that SNe with higher velocities are brighter, have smaller pseudo-equivalent widths, faster declining light curves, shorter optically thick duration phases and plateau durations, and lower Ni mass. Discussion is presented on the physical meaning of all of our defined observational spectral and photometric parameters. A statistical processing reveals a continuum in spectral and photometric parameters. We speculate that this suggests a continuum in the underlying progenitor population. We also study the nature of the extra absorption component on the blue side of HP-Cygni profile. We concluded that this component in early spectra (before 35 days) is associated with Si II 6355, while in the plateau phase is related with high velocity features (HVFs) of hydrogen lines. The latter can be used to constrain the nature of the circumstellar environment of SNe II, and their progenitor stellar winds.

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