CSP-II SE-SNe spectroscopy in the NIR MELISSA SHAHBANDEH,
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CARNEGIE SUPERNOVA PROJECT COLLABORATION — I will present a sam-
ple of 109 near-infrared (NIR) spectra of 40 Stripped Envelope Core Collapse Su-
pernovae (SESNe), obtained by the Carnegie Supernova Project II (CSP-II). This
diverse dataset constitutes the largest NIR sample of SESNe. NIR spectroscopy
provides a unique probe for SN physics with several advantages over observations
in the optical. Specifically, the He I and C I lines are stronger and more isolated in
the NIR. This advantage combined with our large sample allows us to investigate
long-standing issues. For example, are SNe Ic truly stripped of their helium or are
their helium shells not being sufficiently excited by gamma-rays? We found that all
subclasses show a strong profile at 1.05 micron. By using different constraints in-
cluding velocity and line strength of this feature for selected SNe within the sample,
we show that the 1.05 micron feature is most probably carbon in Type Ic SNe. This
result indicates that in SNe Ic there is no significant amount of helium shell present.
We also detect CO in 8 SNe within the sample, which appears as early as 50 days.
CO is an effective cooler and can help us understand the dust production in SESNe.

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