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SPECTROSCOPIC ANALYSIS OF HYDRODYNAMICAL MODELS OF TYPE IA SUPERNOVAE PEARL MALLICK, University of Massachusetts Dartmouth, KHANAK BHARGAVA, Stony Brook University, ROBERT FISHER, University of Massachusetts Dartmouth — Type Ia supernovae (SNe Ia) are the result of thermonuclear explosions of white dwarfs (WD) in binary systems. Due to their consistent luminosity, SNe Ia are important standardizable candles for cosmology, and have helped to reveal the presence of dark energy and obtain precise values of the Hubble constant. Further study of SNe Ia could also help understand the exact nature of their stellar progenitors, which remains in question. Recently-developed computational techniques demonstrate the possibility for advanced hydrodynamical modeling of SNe Ia, which can help identify their features through simulation. We present a pipeline of multiphysics and multiscale simulation codes, which are capable of modeling the initial few seconds of the hydrodynamics of the explosion (FLASH), through the subsequent detailed nucleosynthesis (TORCH), and radiative transfer weeks later (SuperNu). A final synthetic spectral classification (SNID) can then be used to enable direct comparison between the model predictions and observed SNe Ia.

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