

Abstract Submitted
for the APR15 Meeting of
The American Physical Society

Dark matter admixed Type Ia supernovae¹ SHING CHI LEUNG, MING CHUNG CHU, LAP MING LIN, Department of Physics and Institute of Theoretical Physics, The Chinese University of Hong Kong, Hong Kong, China — We perform two-dimensional hydrodynamic simulations for the thermonuclear explosion of Chandrasekhar-mass white dwarfs with dark matter (DM) cores in Newtonian gravity. We include a detailed nuclear reaction network and make use of the pure turbulent deflagration model as the explosion mechanism in our simulations. Our numerical results show that the general properties of the explosion depend quite sensitively on the mass of the DM core M_{DM} . A larger M_{DM} generally leads to a weaker explosion and a lower mass of synthesized iron-peaked elements. In particular, the total mass of ^{56}Ni produced can drop from about 0.3 to 0.03 M_{sun} as M_{DM} increases from 0.01 to 0.03 M_{sun} . We have also constructed the bolometric light curves obtained from our simulations and found that our results match well with the observational data of sub-luminous type Ia supernovae.

¹This work is partially supported by a grant from the Research Grant Council of the Hong Kong Special Administrative Region, China (Project No. 400910).

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Date submitted: 06 Jan 2015

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