

Thomas L. Papatheodore
University of Tennessee

Abstract

Type Ia Supernovae: Double-Detonations from Confined Helium Belts

Although there is still considerable debate on the explosion mechanism(s) of Type Ia supernovae (SNe Ia), there is general consensus that the progenitor is a carbon/oxygen white dwarf (C/O WD) in a binary system. Scenarios involving massive white dwarves in binaries with normal stars, double white dwarf binaries, or low mass white dwarves with normal stars are all under investigation. Peculiar features of some otherwise normal SNe Ia have led to speculative variations of these scenarios. In this work, we focus on a modified version of the low mass white dwarf scenario that was recently suggested to explain unusual gamma-ray observations of SN2014J. Using the FLASH code, we performed 2D axisymmetric simulations in order to explore the ability of this modified explosion mechanism to produce the observed features.