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# IMPROVED ANALYSIS OF TYPE 1A SUPERNOVA USING MIXING-LENGTH THEORY

**Abstract**

In binary star systems when one of the stars is a white dwarf, a Type Ia supernova can occur. The other star could range in size from a massive star to a tiny white dwarf. In essence, there are many models for type 1a supernovae. But our focus is on general hypothesis,referred to as single-degenerate models, involves a developing star in orbit around a white dwarf, similar to the models of dwarf novae and novae.And though,here,the mass striking the white dwarf causes a Type Ia supernova, which completely destroys the white dwarf. Whereas this particular collection of models is currently the most popular, the mechanics of the eruption are still undetermined. There is another single-degenerate models. It does not include degenerate helium burning on the surface. Two and three dimensional models indicate that several, self sufficient ignition points may take place in the core of the star as it nears the fatal limit, leading to nonspherical events. Much discussion and current study surround what happens next.The ensuing burning front of carbon and oxygen may occur at subsonic speeds(deflagration event), or it may speed up and steepen to generate a supersonic burning front (detonation, or a true explosion).The maximum luminosity and rate of decay after maximum,as well as the relative abundances of the elements created as seen in the spectrum, are all impacted by how the burning front moves forward precisely. Naturally,successful double-degenerate models are also subject to the deflagration vs. detonation debate.In order to address these, the paper will make some assumptions from mixing-length theory, develop an analytical model of stellar convection,and then briefly discuss simulation studies of single degenerate type 1a supernovae. This will allow us to understand why nonspherical events, flares, and DDT events in type 1a supernovae occur. Finally, we will learn the specifics of the eruption, including how it began.Some studies indicate that it began about 150–200 km from the system's core, while our model predicts that it began far earlier. Moreover,there is still much to learn about Type Ia supernovae,which are crucial to many facets of contemporary astrophysics. Lastly,these research show how to cope with the DDT event by leveraging certain features of mixing- length theory,and we potentially expand our understanding of a variety of other characteristics of type 1a supernovae, such as flares and separate ignition locations.