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Relativistic neutrino transport and chilarilty in supernova explosion

Neutrinos play a key role in supernova explosions. When a massive star explodes, most of the gravitational binding energy released by the collapse of the core is carried away by neutrinos. In order to understand the mechanism of the supernova explosion and subsequent evolution of massive stars, we are going to discuss the neutrino transport appropriately to find the angular moment equations, also we will derive the radiative hydrodynamic equations for a couple system of neutrino radiation and matter both in the general relativistic framework. We obtained the neutrino transport equation and also derive the conservation of mass. The obtained equations are used to obtain the numerical solutions of supernova explosions and, at the end, we discuss about chirality of neutrinos and the helical effects that it induce.

Mini-abstract

General Relativistic hydrodynamics and neutrino transport in supernova explosion and helical effects

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