

Rapidly Rotating Core-Collapse Supernova Progenitors from Binary Stellar Evolution

Rapidly rotating core-collapse supernovae are key to the formation of exotic compact objects such as magnetars and are potential sources of strong gravitational wave emission. Binary interaction offers one of the most promising pathways to spin up massive stars and endow them with high angular momentum at the point of collapse. In this study, we employ the stellar evolution code MESA to explore how binary mass ratio and orbital period affect angular momentum transfer in low-metallicity, massive binary systems. We evolve the systems through the mass transfer phase up to detachment, and subsequently follow the separate evolution of both donor and accretor stars until core collapse.

Section

High Energy

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