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The formation of (heavy) magnetars and collapsars

Using numerical simulations in two and three dimensions, we investigate the collapse of the highly compact cores of high-mass stars with varying degrees of rotation and magnetic fields that are commonly considered progenitors of gamma-ray bursts (GRBs) within the collapsar or the proto-magnetar model. Our simulations aim to find the specific values of the magnetic field and its topology that separate the formation of proto-magnetars from collapsars. We will show the outcome or our models for various stellar progenitors including different metallicities and masses.

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