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The Magnetorotational Explosion Mechanism in Full 3D Core-Collapse Supernova Simulations SHERWOOD RICHERS, PHILIPP MOESTA, CHRISTIAN OTT, ANTHONY PIRO, ROLAND HAAS, KRISTEN BOYDSTUN, ERNAZAR ABDIKAMALOV, CHRISTIAN REISSWIG, Caltech, ERIK SCHNETTER, Perimeter Institute — We present the first fully 3D general-relativistic magneto-hydrodynamics (GRMHD) simulations of stellar collapse in rapidly rotating, magnetized progenitors using a microphysical equation of state and a Leakage neutrino transport approx imation. We perform simulations in 3D both with octant symmetry and with no imposed symmetries of the same 25 $M_\odot$ progenitor. We show that in the simulation without symmetries a kink instability disrupts the initial formation of a jet, while octant symmetry allows the jet to stably propagate and leads to a jet-driven explosion. Rising magnetic bubbles expand the shock of the symmetry-free simulations at later times, but the star's ultimate fate is uncertain.

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