Incorporating Relativity into FLASH Multiphysics Simulations[1]

MICHAEL PAJKOS, Michigan State University

From creating unique compact objects to evolving the chemical composition of the universe, better understanding the explosive ending to massive stars, core collapse supernovae (CCSNe), is beneficial to the field of astrophysics as a whole. Proper numerical models of CCSNe must incorporate a wide range of length scales and a variety of physics. The resulting immense computational cost demands the use of high performance computing resources. We present new physics features that incorporate general relativistic magnetohydrodynamics (GRMHD) into the FLASH code framework to support CCSN modeling. Likewise, we show simulation results from highly energetic, dynamical systems that rely on GRMHD.