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**An Updated Nuclear Equation of State for Neutron Stars and Supernova Simulations** M.A. MEIXNER, G.J. MATHEWS, University of Notre Dame, H.E. DALHED, N.Q. LAN — We present an updated and improved Equation of State based upon the framework originally developed by Bowers & Wilson. The details of the EoS and improvements are described along with a description of how to access this EOS for numerical simulations. Among the improvements are an updated compressibility based upon recent measurements, the possibility of the formation of proton excess ( $Y_e > 0.5$ ) material and an improved treatment of the nuclear statistical equilibrium and the transition to pasta nuclei as the density approaches nuclear matter density. The possibility of a QCD chiral phase transition is also included at densities above nuclear matter density. We show comparisons of this EOS with the other two publicly available equations of state used in supernova collapse simulations. The advantages of the present EoS is that it is easily amenable to phenomenological parameterization to fit observed explosion properties and to accommodate new physical parameters.

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