

Abstract Submitted  
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**Potential Model Approaches to the Supernova Equation of State<sup>1</sup>**

KEN MOORE, MADAPPA PRAKASH, Ohio University, CONSTANTINOS CONSTANTINOU, SUNY at Stony Brook — We employ the Hamiltonian density constructed in [1] to calculate the equation of state (EOS) relevant for core collapse supernova simulations. Thermodynamic properties (such as the free energy, pressure, and chemical potentials) are calculated as functions of baryon density, proton to baryon ratio and temperature. These properties are then compared with results obtained using traditional Skyrme-like interactions in order to isolate regions of agreement and/or disagreement. For the bulk homogeneous phase, results from analytical expressions are compared with the exact results in the non-degenerate (classical) and degenerate (quantum) cases. Our future plans are to extend our calculations to the subnuclear region in which nuclei are present. Comparisons with the supernova EOS of Lattimer and Swesty [2] will also be performed.

[1] A. Akmal, V. R. Pandharipande and D. J. Ravenhall, Phys. Rev. C. 58, 1804 (1998).

[2] J. M. Lattimer and F. D. Swesty, Nucl. Phys. A., 535 (331) 1991.

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