Constrained Molecular Dynamics (CoMD) Model With Generalized Symmetry Energy[1] JAIME SAHAGUN, HUA ZHENG, ALDO BONASERA, Cyclotron Institute, Texas A&M University — Constrained Molecular Dynamics is a computer program which models the dynamics and interactions of nucleons in nuclei. CoMD is a model in which the computational time is short enough to allow the study of the heaviest nuclei systems. Following the liquid drop model and including the Pauli Exclusion Principle, CoMD is used to study the Nuclear Equation of State (NEOS). Studying the NEOS through computer modeling can help predict and study exotic stable and unstable nuclei, light and heavy isotopes extending the chart of nuclides. Operation consists of producing ground state nuclei, and modeling collisions between these nuclei. It can also be used to predict whether or not a certain system consisting of any combination of nucleons can be stable. Since the model is currently fairly simple in principle, the goal is to modify the code adding a more robust equation for the symmetric potential energy, which in turn will produce more general data to study and analyze. The idea is that the symmetry potential takes a similar shape as the two body potential and the three body potential which is explained by Giuliani, Zheng and Bonasera, Progress in Particle and Nuclear Physics 76, 116 (2014). Once modified, it will be tested and compared to the original results.

Jaime Sahagun
Cyclotron Institute, Texas A&M University

Date submitted: 24 Jul 2014   Electronic form version 1.4