Abstract Submitted
for the APR13 Meeting of
The American Physical Society

Critical scaling of excited nuclear systems from quantum fluctuations JUSTIN MABIALA, Cyclotron Institute, Texas A&M University, College Station, Texas 77843, USA — At finite temperatures and low densities, nuclei may undergo a phase transition similar to a liquid-gas phase transition. Temperature is the control parameter while density and pressure are the conjugate variables. Thermodynamic properties of fragmenting systems formed in the reactions 64Zn+64Zn, 64Ni+64Ni and 70Zn+70Zn at beam energy of 35 MeV/nucleon were studied. Temperatures and densities were derived from a recent quantum method which is based on fluctuations in the fragment momentum and fragment multiplicity distributions of light fermions. The pressures were determined from the grand partition function of Fisher's model. Critical scaling of measured quantities is found for the first time for fragmenting systems that differ in proton-neutron asymmetries. These results which account for an experimental signature of a nuclear phase transition will be presented.

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Date submitted: 15 Jan 2013 Electronic form version 1.4