Abstract Submitted
for the HAW05 Meeting of
The American Physical Society

**Equation of state of nuclear matter and nuclei in laboratories and neutron-star crusts** KAZUHIRO OYAMATSU, Aichi Shukutoku University, KEI IIDA, RIKEN BNL Research Center — We systematically examine how sensitive macroscopic properties of nuclei in laboratories and neutron-star crusts are to the density dependence of the symmetry energy. Using macroscopic nuclear models constructed in such a way that they reproduce empirical data for masses and radii of stable nuclei equally well, while depending on the still uncertain parameters such as the symmetry energy density derivative coefficient $L$ and the nuclear matter incompressibility $K_0$, we calculate radii and masses of heavy unstable nuclei, the charge number of nuclei in neutron star crusts, and the deepest end of the crust at which nuclei melt into uniform matter. We find that the results for all these quantities show almost no $K_0$ dependence but appreciable $L$ dependence. Future possible determination of $L$ from radioactive ion beam experiments and its significance for the presence of "pasta" nuclei in neutron star crusts are finally discussed.

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Date submitted: 17 May 2005 Electronic form version 1.4