Heavy baryon properties in nuclear medium, and a possibility of charmed-nuclei

K. Tsushima (1), F.C. Khanna (2)[1]

(1) Department of Physics and Astronomy, University of Georgia, Athens, GA 30602, USA
(2) CSSM, Adelaide University, Adelaide, SA 5005, Australia

Properties of heavy baryons, $\Lambda_c, \Sigma_c, \Xi_c$ and Λ_b, which contain at least one u or d light quark, will be studied in nuclear medium. This may shed light on the role of the light quarks in heavy system, concerning the partial restoration of chiral symmetry in nuclear medium. After calculating effective masses (scalar potentials) and vector potentials for these heavy baryons in nuclear matter, we will study systems of finite nuclei, i.e., a possibility of charmed-nuclei corresponding to hypernuclei with "charm". We plan to calculate single-particle energies for Λ_c^+, embedded in ^{40}Ca and ^{208}Pb, extending the calculations for hypernuclei [1]. This may stimulate future JHF experiments.

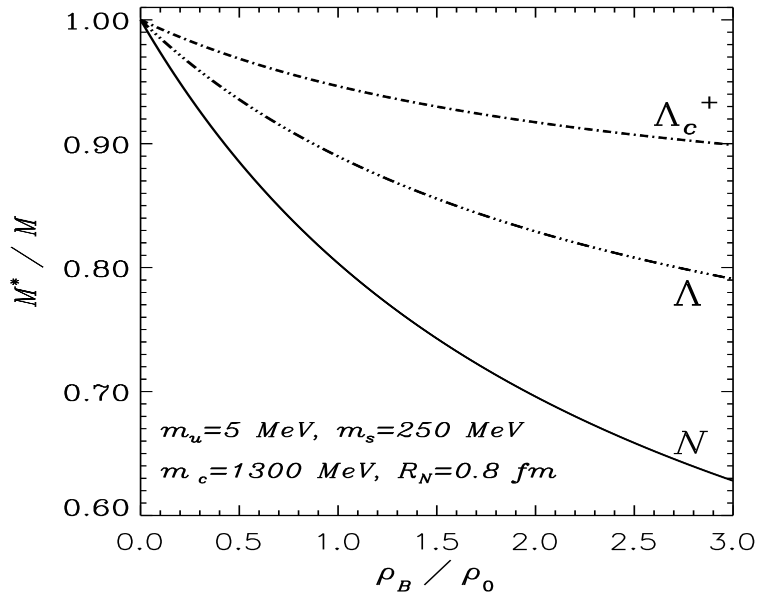

Figure 1: Effective mass in nuclear matter as a function of baryon density, $\rho_0 = 0.15 fm^{-3}$.

References

[1] K. Tsushima, K. Saito and A. W. Thomas, Phys. Lett. **B 411** (1997) 9; (E) *ibid* **B 421** (1998) 413; K. Tsushima, K. Saito, J. Haidenbauer, and A.W. Thomas, Nucl. Phys. **A630** (1998) 691.

[1]Permanent address: Physics Department, University of Alberta Edmonton, Alberta, Canada T6G 2J1