Abstract Submitted
for the HAW09 Meeting of
The American Physical Society

Proposed experiment for the observation of the isovector spin monopole resonance via the exothermic charge-exchange reaction using the SHARAQ spectrometer SHUMPEI NOJI, HIDEYUKI SAKAI, Department of Physics, University of Tokyo, SHARAQ COLLABORATION — We are developing the exothermic charge-exchange reaction induced by the β-unstable beam, (^{12}N, ^{12}C), as a new probe for the study of spin-isospin modes in nuclei. Good features of this reaction include the large mass difference of ^{12}N and ^{12}C, the spin-isospin selection of $\Delta S = \Delta T = 1$, and the surface-sensitivity due to the strong absorption. They are suited for the study of spin-isospin modes such as the isovector spin monopole resonance (IVSMR). We have proposed, at the RI Beam Factory (RIBF) at RIKEN, a measurement of the ^{90}Zr(^{12}N, ^{12}C) reaction at 200A MeV at 0 degrees to observe the IVSMR in ^{90}Nb. The ^{12}N beam is produced via the projectile fragmentation of the ^{14}N primary beam at 250A MeV and separated in the BigRIPS, and transported through the dispersion-matched beam line to the reaction target of ^{90}Zr. The reaction product of ^{12}C is momentum analyzed by the newly constructed SHARAQ spectrometer. We performed commissioning experiments in March and May, 2009, to study the production of the ^{12}N secondary beam and the ion optical properties of the beam line and the SHARAQ spectrometer. We report the results from the commissioning experiments together with the present situation of this project.

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Date submitted: 01 Jul 2009 Electronic form version 1.4