

# SPIN-ISOSPIN STUDIES WITH RI-BEAM INDUCED CHARGE EXCHANGE REACTIONS

Dr. Tomohiro Uesaka,  
Center for Nuclear Study, University of Tokyo  
Tuesday, March 1, 2011  
4:00 P.M. NSH 124

RI-beam induced charge-exchange reactions have unique properties missing in stable-beam induced reactions. RI-beam induced reaction can, therefore, be used to reveal new aspects of spin-isospin responses in nuclei. We have constructed the high-resolution SHARAQ spectrometer at the RI Beam Factory (RIBF) to exploit this potential of RI-beam induced reactions. In a first series of experiments with the SHARAQ spectrometer, we have investigated isovector monopole resonances in nuclei via the ( $t, {}^3\text{He}$ ), ( ${}^{12}\text{N}, {}^{12}\text{C}$ ), and ( ${}^{10}\text{C}, {}^{10}\text{B}$ ) reactions.

The ( $t, {}^3\text{He}$ ) experiment was performed in 2009 to search for  $b^+$  type isovector-spin monopole resonances (IVSMR) in  ${}^{90}\text{Zr}$  and  ${}^{208}\text{Pb}$ . The ( $t, {}^3\text{He}$ ) reaction at 300 MeV/nucleon was used to extract  $b^+$  strengths selectively. We have successfully observed signatures of the IVSMR at excitation energies of 12 MeV and 20 MeV in  ${}^{208}\text{Pb}$  and  ${}^{90}\text{Zr}$ , respectively. The values of excitation energies are in good agreement with theoretical predictions.

The ( ${}^{12}\text{N}, {}^{12}\text{C}$ ), and ( ${}^{10}\text{C}, {}^{10}\text{B}$ ) experiments were conducted in October 2010.

In this seminar, I will present recent results from these three experiments, after explaining key ideas of RI-beam induced charge-exchange reactions. Future perspectives using double charge exchange reactions will be also discussed.

Nuclear  
Seminar

All interested  
persons are  
cordially  
invited to  
attend.