Contribution ID: **2** Type: **Oral Presentation**

Measurement of the isoscalar monopole response in the neutron-rich 68Ni using Active Target MAYA

Monday, 18 May 2015 16:50 (25 minutes)

The study of the Isoscalar Giant Monopole Resonance (ISGMR) in stable nuclei provided relevant information on both nuclear matter and nuclear structure in past decades. For instance the ISGMR centroid can be linked to the incompressibility modulus of the infinite nuclear matter. Values for exotic nuclei would help in constraining it. In unstable nuclei, only one measurement has been performed so far (56Ni) [1]. Moreover the existence of a soft mode is predicted by different theoritical models in neutron-rich isotopes but has never been observed. In order to study the evolution of the monopole response along an isotopic chain, measurements in neutron-rich Ni are called for.

To reach this goal, a dedicated experiment was performed at GANIL. A 68Ni beam at 50MeV/A and with an intensity of 4.104pps has been produced on LISE beamline. The inelastic scattering of deuteron and alpha particles on 68Ni in inverse kinematics has been studied. Due to the low energies of the recoiling particles, the use of an active target is suitable, so the experiment has been performed with the active target MAYA. It is the first attempt to measure the ISGMR in an unstable neutron-rich nucleus. Excitation energy spectra and angular distributions concerning the inelastic scattering reaction in deuterons gas and in alpha gas have been extracted and will be shown. The measurement of the ISGMR and a soft mode will be discussed, as well as the observation of the Isoscalar Giant Quadrupole Resonance (ISGQR). These results [2-3] are promising for the physics of Giant Resonances in exotic nuclei, but the resolution is limited, in this way the development of future active targets will be very helpful and will be discussed.

[1] C. Monrozeau et al., Phys. Rev. Lett. 100, 042501 (2008).
[2] M. Vandebrouck et al., Phys. Rev. Lett. 113, 032504 (2014).
[3] M. Vandebrouck et al., « Measurement of the Isoscalar Giant Resonances in the Neutron-rich Nucleus 68Ni » in preparation.

Primary authors: Prof. KHAN, Elias (IPNO); Dr GIBELIN, Julien (LPC Caen); Dr VANDEBROUCK, Marine (GANIL)

Co-authors: Dr FERNANDEZ-DOMINGUEZ, B. (Universidade de Santiago de Compostela); Dr STODEL, C. (GANIL); Dr BEAUMEL, D. (IPNO); Dr SUZUKI, D. (IPNO); Dr DELAUNAY, F. (LPC Caen); Prof. COLO, G. (INFN); Dr GRINYER, G.F. (GANIL); Dr BABA, H. (RIKEN); Dr SAVAJOLS, H. (GANIL); Dr THOMAS, J.C. (GANIL); Dr CACERES, L. (GANIL); Dr CAAMANO, M. (Universidade de Santiago de Compostela); Prof. HARAKEH, M.N. (KVI University of Groningen); Prof. KALANTAR-NAYESTANAKI, N. (KVI University of Groningen); Prof. KEELEY, N. (National Centre for Nuclear Research ul. Andrzeja Sołtana); Dr ACHOURI, N.L. (LPC Caen); Dr SORLIN, O. (GANIL); Dr ROUSSEL-CHOMAZ, P. (CEA DSM); Prof. RAABE, R. (KU Leuven); Dr ROGER, T. (GANIL); Prof. GARG, U. (Univ. of Notre-Dame); Prof. MITTIG, Wolfgang (MSU-NSCL); Dr BLUMENFELD, Y. (IPNO); Dr PANCIN, julien (GANIL)

Presenter: Dr VANDEBROUCK, Marine (GANIL)

Session Classification: Session 4

Track Classification: Physics and Experiments