MEASUREMENTS OF THE ISOSCALAR MONOPOLE RESPONSE IN THE NEUTRON-RICH NUCLEUS $^{68}$Ni

M. Vandebrouck, GANIL, Caen, France

1 IPN Orsay, Université Paris-Sud, IN2P3-CNRS, F-91406 Orsay Cedex, France
2 LPC Caen, ENSICAEN, Université de Caen, CNRS/IN2P3, F-14050 CAEN Cedex, France
3 RIKEN Nishina Center, 2-1 Hirosawa, Wako, Saitama 351-0198, Japan
4 Universidad de Santiago de Compostela, E-15782 Santiago de Compostela, Spain
5 Grand Accélérateur National d’Ions Lourds (GANIL), CEA/DSM-CNRS/IN2P3, 14076 Caen, France
6 Dipartimento di Fisica Università degli Studi di Milano and INFN, Sezione di Milano, 20133 Milano, Italy
7 Physics Department, University of Notre-Dame, Notre Dame, Indiana 46556, USA
8 KVI-CART, University of Groningen, NL-9747 AA Groningen, The Netherlands
9 National Centre for Nuclear Research ul. Andrzeja Soltana 7, 05-400 Otwock, Poland
10 NSCL, Michigan State University, East Lansing, Michigan 48824-1321, USA
11 Instituut voor Kern-en Stralingsfysica, K.U. Leuven, B-3001 Leuven, Belgium
12 CEA-Saclay, DSM, F-91191 Gif sur Yvette Cedex, France

The study of the Isoscalar Giant Monopole Resonance (ISGMR) and the Isoscalar Giant Quadrupole Resonance (ISGQR) 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 ($^{56}$Ni) [1]. In order to study the evolution of the ISGMR and the ISGQR along an isotopic chain, measurements in neutron-rich Ni are called for.

To reach this goal, a dedicated experiment was performed at GANIL. A $^{68}$Ni beam at 50AMeV and with an intensity of $10^4$p/p was produced on LISE beamline. The inelastic scattering of deuteron and alpha particles on $^{68}$Ni in inverse kinematics has been studied with the active target MAYA [2]. It is the first attempt to measure the ISGMR in an unstable neutron-rich nucleus. Results concerning the inelastic scattering reaction in deuterons gas and in alpha gas will be shown, and the measurement of the ISGQR, ISGMR and indication of a soft mode will be discussed.

REFERENCES