Contribution ID: **82** Type: **Oral**

Shell evolution and effective three-body forces in the newly-explored neutron-rich region around Z=82 and far beyond N=126

Monday, 21 May 2012 12:20 (20 minutes)

The study of exotic nuclei has shown that significant changes of the well known shell structure along the stability valley occur. However, little is known on the neutron-rich nuclei around 208Pb, because of the experimental difficulties to reach such nuclei. The study of these heavy nuclei is relevant also for the understanding of the r-process stellar nucleosynthesis in heavy nuclei. Neutron-rich nuclei around 208Pb were populated by using a 1 GeV*A 238U beam at GSI. The resulting fragments were separated and analysed with the FRS-Rising setup. Many neutron-rich isotopes were identified for the first time and a significant number of new isomers were hence discovered, enabling to study the structure of these isotopes. The new exotic isotopes observed, extend up to 218Pb along the Z=82 shell closure and up to N=134 and N=138 for the proton-hole and proton-particle Tl and Bi nuclei, respectively. The very exotic 210Hg nucleus was also produced and studied: its unexpected structure will be discussed. In our talk, the experimental results will be presented within state-of-the-art shell-model calculations. The significant discrepancies between the experimental findings and the behaviour expected from the usual seniority scheme will be pointed out, showing how the inclusion of effective three-body interactions (and the related two-body transition operators) helps to improve the agreement between theory and experiment.

Primary author: Mr GOTTARDO, Andrea (INFN - LNL)

Co-authors: Prof. BRUCE, Alison (Univ. Brighton); Dr GADEA, Andres (IFIC - Valencia); Dr BENZONI, Giovanna (INFN - MI); Dr WEICK, Helmut (GSI); Dr VALIENTE- DOBON, José Javier (INFN - LNL); Dr GREBOSZ, Jurek (NINP, Krakow); Dr GORSKA, Magda (GSI); Prof. PFUTZNER, Marek (Univ. Warsaw); Prof. REGAN, Patrick (Univ. Surrey); Dr BOUTACHKOV, Plamen (GSI); Mr NICOLINI, Roberto (INFN - MI); Prof. LUNARDI, Santo (Univ. Padova); Dr PIETRI, Stephane (GSI); Dr PODOLYAK, Zsolt (Univ. Surrey)

Presenter: Mr GOTTARDO, Andrea (INFN - LNL)

Session Classification: Nuclear Structure far from Stability

Track Classification: Nuclear structure far from stability