Contribution ID: **6** Type: **not specified**

b-decay spectroscopy study of neutron rich nuclei around the N=82 shell closure including the r-process waiting points 128Pd

Monday, 23 May 2011 17:00 (20 minutes)

The b-decay study of the region around the N=82 shell closure is critical for r-process models. The experiment that we intend to perform with the addition of the EURICA spectrometer aims to study the decay of the N=82 nuclei 128Pd and 129Ag that are expected to be waiting points for the the r-process in most r-process models, and therefore their study will dramatically improve the reliability of the r-process calculations.
New half-lives will also be measured for more than 30 isotopes with N<82 including the r-process nuclei 124Ru, 113Nb that are predicted to be waiting points in some r–process models.
Our experiment will also extend the E(2+) systematics of the Pd isotopic chain to 122,124Pd. These nuclei are the first isotopes that are affected by the rapid decrease in deformation predicted by the FRDM model that for more exotic nuclei leads to pronounced changes in the r-process path. E(2+) will also be measured for 116,118Ru and 112Mo, three important nuclei in a region where deformation is the focus of intense theoretical and experimental efforts.
The nuclei of interest will be produced by fission of a 345 A/MeV 238U beam colliding with a 9Be target. Fission fragments will be selected by the BigRIPS spectrometer, and implanted in a stack of Si detectors surrounded by g detector setup such as the EURICA detectors.
With our experimental apparatus we will be able to measure half–lives, b–delayed g rays as well as photons from the decay of microsecond isomers. The results will have implications for nuclear structure studies by providing data to improve the parametrization of mass formulas, and will reveal new insights into important open questions such as shell quenching and the neutron pairing interaction.
The use of the EURICA spectrometer will be highly beneficial for this experiment due to the g-detection efficiency that is up to five times higher than compared to the efficiency of the Clover detectors setup available at the RIBF.

Primary author: LORUSSO, Giuseppe (RIKEN)

Presenter: LORUSSO, Giuseppe (RIKEN)

Session Classification: Isomer and beta-gamma spectroscopy of neutron-rich nuclei