

b-decay spectroscopy study of the very neutron rich-nuclei Nb-Cd, including the r-process waiting point 128Pd

Monday, 12 September 2011 15:30 (15 minutes)

The b-decay study of the region around the N=82 shell closure is critical for r-process models. With this experiment we intend 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.

The 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 the EURICA gamma detectors.

With our experimental apparatus we will be able to measure half-lives, b-delayed gamma 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 parameterisation of mass formulas, and will reveal new insights into important open questions such as shell quenching and the neutron pairing interaction.

Primary author: LORUSSO, Giuseppe (RIKEN)

Presenter: LORUSSO, Giuseppe (RIKEN)

Session Classification: Neutron-Rich II