Contribution ID: **7** Type: **Invited**

Optimization Studies of the CERN-ISOLDE neutron converter –fission target system

Monday 27 June 2011 14:00 (20 minutes)

The ISOLDE facility at CERN has been one of the premier ISOL facilities worldwide since it started operating in 1967. More than 1000 isotopes have been produced at ISOLDE, following the bombardment of various primary targets with a pulsed proton beam of energy 1.4 GeV and an average intensity of 2 μA. A tungsten solid neutron converter has been used for ten years to produce neutron rich-fission fragments in UCx targets. However, somewhat reduced beam intensities result from the present layout. In this work, the Monte Carlo code FLUKA was used to study the current layout of the neutron converter –fission target system of the ISOLDE facility. The production rates of neutron-rich isotopes of Zinc and Cadmium were calculated and compared with experimental data. An optimization of the layout of the target system is proposed, that maximizes the production of the mentioned neutron-rich isotopes while reducing the contamination by proton rich isobars that affect the purity of the beams. The Monte Carlo simulations reported in this study show that the ratios of beam over impurities 80Zn/80Rb and 130Cd/130Cs can be increased by more than one order of magnitude with respect to the present layout. Since the absolute figure of merit for any radioactive ion beam facility comes from both its delivered beam intensities and their purities, this work provides a good example on how future increases of the primary beam intensities and energies at HIE-ISOLDE and EURISOL can be best exploited to deliver high rates of pure beams around the doubly magic nuclei 78Ni and 132Sn.

Author: FERNANDES LUIS, Raul (ITN)

Co-authors: MARQUES, José (ITN); ZANINI, Luca (PSI); VAZ, Pedro (ITN); STORA, Thierry (CERN)

Presenter: STORA, Thierry (CERN)

Session Classification: Neutron Converter Studies