

Abstract for SATIF-8: shielding and dosimetry
Pohang Accelerator Laboratory, 22-24 May 2006

Dose estimates and shielding design for the EURISOL facility

Marta Felcini
(CERN and University of California Los Angeles)
on behalf of the EURISOL DS WP5 Working Group

Abstract

The proposed European Isotope Separation On-Line (EURISOL) facility is an ISOL-type next-generation Radioactive Ion Beam (RIB) facility which will address the major challenges in the fundamental understanding of nuclear structure and many-body interactions between hadrons, as well as in the study of nuclear interactions which determine stellar evolution.

The EURISOL facility makes use of a linac producing a proton beam of 1 GeV energy and up to 5 MW power, directed onto four target stations for isotope production. Three of the targets (direct targets) will receive 100 kW beam power. A fission target using liquid mercury as neutron converter will receive the full beam power.

The knowledge of the prompt dose rate during operation, the material activation and the dose rate after operation, induced by residual activity in the targets, the proton driver and surrounding materials, is needed to determine shielding parameters and procedures for the handling of radioactive materials during and after operation.

To evaluate dose rates and material activation, we simulate the EURISOL beam and target set-up using the FLUKA and the MCNPX Monte Carlo (MC) particle transport codes.

To validate the MC predictions for material activation, we have compared the MC predictions for isotope production to measurements in materials of interest for possible EURISOL target and shielding construction.

We present a status of the simulation studies for possible configurations of the target stations, in terms of estimates of dose rates, shielding parameters and material activation.

Project supported by EC under EURISOL DS Contract no. 515768 RIDS, www.eurisol.org.