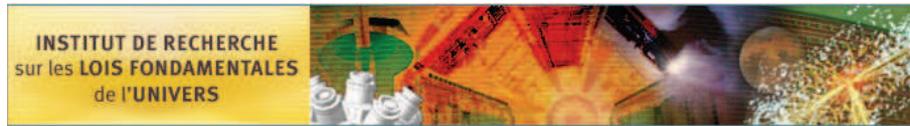


Service de Physique Nucléaire



Séminaire

le vendredi 21 février 2014 à 11h

CEA Saclay, Orme des Merisiers, Bât. 703, Salle 135

The HIE-ISOLDE project at CERN – Radiation Protection study for the future post-accelerator

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CERN/DGS-RP

The HIE-ISOLDE project will allow the expansion of the physics program and facilitate nuclear physics studies at the ISOLDE facility at CERN, which produce and accelerate radioactive ion beams from He to U.

This upgrade contains three major elements : higher energies, improvements in beam quality and higher beam intensities. The most significant improvement is the replacement of the current post-accelerator (REX) by a superconducting linac delivering ions of energy up to 10 MeV/u. This will allow beams to be accelerated to energies well below and significantly above the Coulomb barrier.

In particular, this energy upgrade leads to new radiological hazards such as neutron emission from ions accelerated above the Coulomb barrier and X-ray emission from RF cavities. In order to evaluate these risks, X dose rates emitted by cavities were first measured during RF tests around the cavity prototypes. Secondly, FLUKA simulations were performed to assess shielding requirements and the geometry of the tunnel as well as to evaluate resulting neutron dose rates for the different ion beams and beam intensities available.

During my presentation, I will give a general overview of the ISOLDE facility and present the technical developments required for the HIE-ISOLDE project. I will then focus on the radiation protection aspects related to the post-accelerator upgrade : FLUKA simulations for X-ray and neutron emission as well as X-ray measurements will be presented, as well as the different safety measures taken against radiological hazards in the experimental hall.

Le café sera servi 10 minutes avant

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