

Talk 3: The experience of HollandPTC in setting up a radiation hardness test facility

Thursday, 13 June 2024 12:10 (20 minutes)

Abstract:

HollandPTC is a proton therapy facility for patient treatments and research located in Delft, The Netherlands. HollandPTC has a dedicated R&D proton beamline for preclinical research. In this presentation, we summarize how an experimental setup for radiation hardness tests was integrated in our R&D proton beamline. In 2021, in collaboration with ESA, the beamline was equipped, characterized and prepared to perform radiation hardness tests for space applications. The main requirement for building such a setup was to have a proton beam that met the standards for SEE tests in terms of energy and fluxes. In this context, beam energies of 70, 120, and 200 MeV were characterized for both pencil beam and broad beams with different fluxes, matching the needs for SEE tests on EEE components and boards. Broad beams are produced with a passive scattering system, for 2 different squared sizes 4x4cm² and 10x10cm², with a uniformity between 90% and 98% and beam flux between 4.6x10⁴ and 2.1x10⁸ p/s/cm². A target station with motorized stages in x-y direction (beam direction along z-axis) has been realized with a standard board mounting provided by ESA, which is positioned in a unique isocenter where the switch between pencil beam and broad beam can be performed within 10-15 minutes. In addition to the technical aspects, we will address challenges related to setting up a facility for hardness tests in a clinical environment, including: managing capacity of beam time and personnel, distribution of beam time hours among HollandPTC research consortium partners and space applications, implementing beam time application procedure for users, and establishing of cost rates. Since 2022, HollandPTC successfully hosted multiple groups both from ESA and private companies in the space field, to perform radiation hardness tests.

CV:

Marta Rovituso is the beam line scientist of HollandPTC since January 2019. Her main core job in the last 5 years was to develop the R&D beam line of HPTC for multidisciplinary purposes, going from radiobiology experiments, to fundamental physics, to space application. She got her PhD in Physics at the Technical University of Darmstadt, performing her experimental work in GSI, in the biophysics department. During this time, she worked not only on hadrontherapy experiments but also on radioprotection for space with the supervision of Prof. Marco Durante.

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Session Classification: Session 5: Protons and Heavy Ions: The Facilities' View