

HiRadMat: A Unique Facility Testing Materials with High Power Pulsed Beam

Tuesday, 5 June 2018 18:00 (10 minutes)

The advancement of high power targets and accelerator components is dependent on the exploitation of irradiation facilities to assess these constituents for R&D purposes. HiRadMat (High Radiation to Materials) is an irradiation facility at CERN designed to provide material testing capabilities to a range of R&D projects using pulsed high energy, high intensity, proton and ion beams. Since its commissioning in 2011, HiRadMat has successfully delivered single pulsed proton beams to a multitude of novel experiments. The beam obtained directly from the TT60 line of the SPS, comparable to that extracted by the LHC, is at 440 GeV/c. A 1σ r.m.s. beam radius of 0.25 – 2 mm with a range of 1 to 288 protons per pulse at 1.2×10^{11} protons per bunch maximum (equivalent lead/argon ion beams available) can currently be delivered. Over 30 experiments have utilised this unique environment to test not only materials, but electronic devices, detectors and optical systems. Through Transnational Access support, currently under WP10 of ARIES, financial assistance can be provided to external users enabling an increase in the use of this irradiation facility by global institutes. The future strategy of HiRadMat is currently under examination. Facility consolidations, considering the increasing experimental demands from experiments and with the upgrade to High-Luminosity LHC with up to 2.3×10^{11} protons per bunch expected for LIU beams (LHC-Injector Upgrade), will be presented. Similarly, expansion into scientific areas beyond the accelerator physics community are to be discussed.

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Session Classification: Poster Session and Reception