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Heavy ion dosimetry and experiments in CHARM: part II

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In the framework of the heavy ion accelerator program, the CHARM facility has been exploited to investigate the effect of Ultra High Energy (UHE, >5 GeV/n) Heavy Ions on electronics. Testing at UHE provides important information on the Radiation Hardness Assurance of the component, however a few facilities allows such high energies (5.9 GeV/n for Pb-ions). In this context, a suitable calibration of the facility is essential to perform accurate radiation tests.

The combination of beam instruments, specifically a Secondary Emission Chamber (SEC) and a Multi Wire Proportional Chamber (MWPC), has been utilized to determine the ion flux as a function of its x-y position. In addition, the shape of the beam has been compared with the one measured by the radiation sensitive Gafchromic films. Electronic-related radiation quantities have been measured by the RadMON system. In particular, the Total Ionizing Dose per ion was measured by the RadFETs, whereas the 1-MeV equivalent Neutron Fluence per ion has been measured by pin-diodes. The results are compared with the theoretical values.

Presenters: BRUCOLI, Matteo (CERN); FERRARO, Rudy (CERN)

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