Contribution ID: **730** Contribution code: **THPM128** Type: **Poster Presentation**

Heavy ion beam characterization for radiation effects testing at CERN using Monte Carlo simulations and experimental benchmarking

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The CHIMERA (up to December 2022) and HEARTS (as of January 2023) projects aim to facilitate radiation effects testing of electronics components using heavy ion beams before deployment in harsh radiation environments such as space or high energy accelerators. The required (micro-) electronics reliability assurance testing conditions can be met by using 100 MeV/n - 5 GeV/n Pb ion beams extracted from CERN's Proton Synchrotron (PS) which have a surface Linear Energy Transfer (LET) range of 10-40 MeV cm2/mg, >1 mm penetration depth in silicon and several cm FWHM beam size. This paper gathers the results from Monte Carlo simulations in FLUKA which were used to understand the transport of ions through the T08 transfer line in the PS East Area, focusing on key effects such as energy straggling, loss of transmission (e.g. through scattering and nuclear fragmentation) and beam size. These calculations served as input for machine development activities and allow us to characterize the radiation field at the testing location, in present and future experimental configurations. The simulation results are compared to instrumentation data obtained during an experimental campaign in November 2022. Potential future upgrades and developments are also discussed.

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: WAETS, Andreas (European Organization for Nuclear Research)

Co-authors: BRETHOUX, Damien (European Organization for Nuclear Research); PRELIPCEAN, Daniel (European Organization for Nuclear Research); JOHNSON, Eliott (European Organization for Nuclear Research); RAVOTTI, Federico (European Organization for Nuclear Research); RONCAROLO, Federico (European Organization for Nuclear Research); CERUTTI, Francesco (European Organization for Nuclear Research); ROMAGNOLI, Giulia (European Organization for Nuclear Research); TAN, Jocelyn (European Organization for Nuclear Research); BILKO, Kacper (European Organization for Nuclear Research); ESPOSITO, Luigi Salvatore (European Organization for Nuclear Research); DELRIEUX, Marc (European Organization for Nuclear Research); FRASER, Matthew (European Organization for Nuclear Research); DURAFFOURG, Michel (European Organization for Nuclear Research); CHARI-

TONIDIS, Nikolaos (European Organization for Nuclear Research); GARCIA ALIA, Ruben (European Organization for Nuclear Research)

Presenter: BILKO, Kacper (European Organization for Nuclear Research)

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