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## Radiation to electronics studies for CERN gamma factory-proof of principle experiment in SPS

*Tuesday, 21 May 2024 16:00 (2 hours)*

The Physics Beyond Colliders is a CERN exploratory study aimed to fully exploit the scientific potential of its accelerator complex. In this initiative, the Gamma Factory experiment aims to produce in the Large Hadron Collider (GF@LHC) high-intensity photon beams in the energy domain up to 400 MeV. The production scheme is based on the collisions of a laser with ultra-relativistic atomic beam of Partially Stripped Ions (PSI) circulating in a storage ring. The collision results in a resonant excitation of the atoms, followed by the spontaneous emission of high-energy photons. A Proof of Principle (PoP) experiment is being planned to study the GF scheme generating X-rays, in the range of keV, from lithium-like lead PSI stored at the CERN Super Proton Synchrotron (SPS). GF-PoP has undergone a series of exhaustive radiation effect studies in view of Radiation to Electronics (R2E) risks. With the use of FLUKA Monte Carlo code, the radiation environment in the laser room and its premises has been estimated during proton and PSI runs. Recorded data from beam instruments has been used to appropriately scale the computed results and to verify the compliance with general R2E limits.

### Footnotes

### Funding Agency

### Paper preparation format

LaTeX

### Region represented

Europe

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