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Novel high intensity gamma-source at CERN: the Gamma Factory Initiative

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The collisions of Partially Stripped Ions (PSI) with laser light to produce high intensity gamma-ray beams are the backbone of the Gamma Factory (GF) initiative.

The source, if realised at LHC, could significantly push up the intensity limits of the presently operating ones, reaching the flux of the order of 10^{17} photons/s, in the particularly interesting gamma-ray energy domain of 1 to 400 MeV.

The unprecedented-intensity, energy-tuned gamma beams, together with the gamma-beams-driven secondary beams of polarized positrons, polarized muons, neutrinos, neutrons and radioactive ions would constitute the basic research tools of the proposed Gamma Factory.

We discuss the GF concept and the preliminary estimates of the emitted gamma beams phase spaces given by two newly developed Monte Carlo codes which simulate the PSI-laser interactions.

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