

# The Gamma Factory path to high-luminosity LHC with isoscalar beams

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Following the successful initial phase of the Gamma Factory (GF) R&D studies—showing that atomic beams can be efficiently produced and accelerated in the CERN rings up to the top LHC energy—the GF collaboration proposes, as the next R&D phase, a Proof-of-Principle (PoP) experiment to study collisions of the laser photons with partially stripped ions at the SPS. Following the presentation of the PoP experiment proposal, I shall concentrate on one of its multiple aspects: a proof of a new, ultra-fast beam cooling technique allowing to reduce the transverse emittance of the SPS ion beam. The positive outcome of the PoP experiment could pave the road to a high-luminosity version of the LHC with colliding isoscalar beams. Such beams are superior with respect to proton beams in multiple aspects of the LHC research programme in particular for the EW and BSM studies.

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