



Contribution ID: 37

Type: **not specified**

Expanding nuclear and hadron physics horizons with the Gamma Factory

A relativistic beam of partially-stripped ions can be irradiated with a laser whose frequency is tuned to a resonant atomic transition which will subsequently de-excite. This mechanism allows one to obtain a γ -source of an unprecedented brilliance and intensity. The Gamma Factory proposed at the LHC is able to produce up to 10^{18} photons per second (7 orders of magnitude beyond the existing sources) with the energy up to 400 MeV, not accessible for FEL sources. A tunable, 100% polarized γ -source of such intensity will furnish us with a versatile tool to significantly improve our understanding of known phenomena, and to study tiny effects that until now have been prohibitively small. The proof of principle experiment at the SPS@CERN will produce 10^{15} γ/s with the energy of up to 44 keV for a variety of exciting applications in atomic and nuclear physics, and is in preparation. The same principle can be applied at other facilities, such as future EIC or FAIR. I give an overview of the reach of the Gamma Factory in hadron and nuclear physics.

Primary authors: Prof. BUDKER, Dmitry (JGU Mainz); Dr KRASNY, Mieczyslaw Witold (Sorbonne U. & CERN); GORSHTeyN, Mikhail (Mainz University)

Presenter: GORSHTeyN, Mikhail (Mainz University)