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# Design modelling of RF injector for ICS gamma-ray source system

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High brightness beams are desired for application to Inverse Compton Scattering (ICS) systems for generation of high-quality x- and ɣ-rays. It opens new opportunities for nuclear physics research in fields such as nuclear photonics, nuclear astrophysics, photo-fission, production of exotic nuclei, applications in medicine, industry and space science. In ICS mechanism high energy electron is interacting with photon. It results in scattered photon with high energy.
Results from computer simulations are presented. Different configurations of S-band injector were analysed. Photocathode RF electron source with diverse arrangement of magnetic devices for beam confinement, and standing wave cavity for initial particle acceleration were implemented. Electron beam parameters have been investigated with use of computer program for tracking particle beam through defined external electric and magnetic fields. Because cross-section of collision between electron and photon beam is very low, high brightness electron beam is crucial specification for gamma beam systems. Electron beam parameters of interest are emittance, beam spot size, average energy, energy spread, electron bunch length, Twiss parameters. Beam density, number of particles in bunch must find good compromise between optimum necessary for creation of high-performance gamma rays and limit in available technology.

## Funding Agency

## Footnotes

## I have read and accept the Privacy Policy Statement

Yes

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