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Gamma beam modulation in Shanghai Laser Electron Gamma Source

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The Shanghai Laser Electron Gamma Source (SLEGS) is one of the beamlines of the Shanghai Synchrotron Radiation Facility, which dedicate to producing gamma beams in the slant-scattering for the first time. After produced in the interaction area, gamma rays pass through a carefully designed Gamma Modulation System (GMS), which consists of a double collimator system, attenuator system, and X/gamma imaging system.

The quasi-monochromatic gamma beams with an energy spread of 4.2-4.6% are produced at the target position by using an aperture of 2 mm of the double collimator system*. The flux of gamma beams is regulated by the gamma attenuator system.

X/gamma imaging system is equipped with two beam-spot monitors, an X-ray camera MiniPIX and the gamma spot monitor. MiniPIX is used for imaging electron-induced bremsstrahlung to reflect the position of gamma beam indirectly. The gamma spot monitor is used to reflect the gamma spatial distribution directly.

With the GMS the gamma beam have been successfully implemented on SLEGS, the obtained high-quality gamma beam has been applied to photoneutron validation experiments. The expected results confirm the reliability of SLEGS gamma quality.

Footnotes

- Hao Z R, Fan G T, Wang H W, et al. Collimator system of SLEGS beamline at Shanghai Light Source[J]. Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 2021, 1013: 165638.

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