

A COMPACT PHOTON SOURCE FOR WACS EXPERIMENT AT JLAB

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Compton scattering off the nucleon is one of the simplest processes that can provide valuable information for the understanding of the nucleon structure. A Wide Angle Compton Scattering (WACS) experiment requires a secondary real photon source from the CEBAF electron beam, that can safely operate in Hall A at JLab. One of the hardware tasks for the team proposing the experiment will be to consolidate the design of the photon source, simulate its performance, and then build it.

The proposed solution is an untagged bremsstrahlung gamma source consisting of a 10% radiation length radiator and a normal conducting magnet to sweep incident beam electrons out of the beam line, with proper shielding inside and around the magnet, making it a sort of mini beam dump. The magnet bore, a copper cylinder with a set of small diameter (2 mm) holes, designed to be 1 m long, will slowly rotate around its axis to perform as a "mechanical raster", to protect the target from overheating.