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Radiation Protection Study for the Assessment of Mixed Fields Ionizing Radiation

Authors : Avram Irina, Coiciu Eugenia-Mihaela, Popovici Mara-Georgiana, Mitu Iani Octavian

Abstract : ELI-NP stands as a cutting-edge facility globally, hosting unique radiological setups. It conducts experiments leveraging high-power lasers capable of producing extremely brief 10 PW pulses on two fronts. Moreover, it houses an exceptional gamma beam system with distinctive spectral characteristics. The facility hosts various experiments across designated experimental areas, encompassing ultra-short high-power laser tests, high-intensity gamma beam trials, and combined experiments utilizing both setups. The facility hosts a dosimetry laboratory, which recently obtained accreditation, where the radiation safety group employs a host of different types of detectors for monitoring the personnel, environment, and public exposure to ionizing radiation generated in experiments performed. ELI-NP's design was shaped by radiological protection assessments conducted through Monte Carlo simulations. The poster exemplifies an assessment conducted using the FLUKA code in an experimental area where a high-power laser system is implemented, and the future diagnostic system for variable energy gamma beams will soon be operational.

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