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Shielding Design and Environmental Dose Monitoring for the ALFA Laser-Plasma Accelerator at ELI Beamlines

Thursday, 30 May 2024 18:00 (20 minutes)

As the commissioning of the laser systems at the ELI Beamlines Facility of ELI ERIC progresses, its laser-driven particle acceleration experiments reach ever higher energies and intensities. Due to the uncertainties in the laser-matter interaction and the variability of the experimental setup, the actual dose rate maps could differ from the results of the Monte Carlo simulations. This requires additional radiation protection measures to ensure safe operation at all times.

One example of such occurrence is the ALFA user station, where electron beams of several tens of MeV are produced with laser wakefield acceleration (LFWA). The station utilizes the L1 Allegra laser which produces < 20 fs long laser pulses at 26 mJ power and 1 kHz repetition rate.

This work presents the Monte Carlo simulations performed with FLUKA v4-3.3 for the design and development of a novel shielding and the environmental dose measurements taken during operation.

Scientific Topic 1

Scientific Topic 2

Scientific Topic 3

Scientific Topic 4

Shielding and dosimetry

Scientific Topic 5

Scientific Topic 6

Scientific Topic 7

Scientific Topic 8

Beam-plasma and laser-plasma interactions and acceleration

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