

Scintillator-based calorimeter for laser-plasma characterization

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With an advent of petawatt (PW) laser systems it has become challenging to detect and properly characterize the high-energy radiation generated in the laser-plasma interaction. A multi-purpose scintillator-based electromagnetic calorimeter has been developed at the ELI Beamlines facility for measuring high-energy interaction byproducts (mainly electrons and photons) in real time. The device can work in online regime on the shot-to-shot basis, which is crucial for the experiments involving high-repetition rate laser systems. A corresponding signal unfolding technique aiming at reconstructing the energy distribution of one or two thermal populations in short time has been developed ad-hoc. Preliminary experimental tests of the calorimeter under photon and electron irradiation were conducted at different facilities, including conventional and laser-driven sources.

References

- [1] V. Istokskaia et al., Experimental tests and signal unfolding of a scintillator calorimeter for laser-plasma characterization. *Journal of Instrumentation*, 16(02), T02006, 2021.