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ELIMED: the first Users beamline dedicated to the irradiation studies with laser-driven ion beams

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The main direction proposed by the community in the field of laser-driven ion acceleration is to improve particle beam features in order to demonstrate reliable approaches to be used for multidisciplinary applications. The mission of the laser-driven ion target area at ELI-Beamlines (Extreme Light Infrastructure) in Czech Republic, called ELI-Multidisciplinary Applications of laser-Ion Acceleration (ELIMAIA), is to provide stable, fully characterized and tunable beams of particles accelerated by Petawatt-class lasers and to offer them to the user community for multidisciplinary applications. The focusing, selecting, measuring and irradiating parts of ELIMAIA, constitutes the so-called ELIMED (ELI-MEDical and multidisciplinary applications) portion. At ELIMED, very high-dose-rate (not less than 10^5Gy/min) controlled proton and ion beams, with energy ranging from 5 to 250 MeV, will be transported up to the in-air section where absolute dosimetry will be carried out with a maximum expected error within 5%. First radiobiological campaign for in-vitro cells irradiation is scheduled for 2020. In this work, the beamline status will be reported along with a complete description of the dosimetric systems and the first calibrations. The expected final beam characteristics, in terms of dose per-pulse, dose-rate, beam spot size, directly derived by Monte Carlo simulations, will be reported, as well.

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