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LIGHT: Generation of highest peak intensities of ultrashort MeV proton bunches and going towards applications

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Laser-driven ion acceleration became a promising field in the past 20 years. The Laser Ion Generation, Handling and Transport (LIGHT) collaboration makes in this field a significant impact. This collaboration was founded to combine laser-driven ion acceleration with conventional accelerator technology. It consists of several university groups (Technische Universität Darmstadt, Technische Universität Dresden, Johann Wolfgang Goethe-Universität Frankfurt) and research centers (GSI Helmholtzzentrum für Schwerionenforschung, Helmholtzzentrum Dresden-Rossendorf, Helmholtzinstitut Jena). In the last few years, a 6 m long test beamline was set up at GSI and sub-nanosecond, intense MeV proton bunches were generated through phase focussing. In the next experiments, the beam homogeneity has been improved to enable the time-resolved imaging capability. Moreover, first energy loss pre-experiments are planned based on specially developed ultrafast diamond detectors.

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