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LIGHT – from laser ion acceleration to future applications[1]
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— Creation of high intensity multi-MeV ion bunches by high power lasers became a reliable tool during the last 15 years. The laser plasma source provides for TV/m accelerating field gradients and initially sub-ps bunch lengths. However, the large envelope divergence and the continuous exponential energy spectrum are substential drawbacks for many possible applications. To face this problem, the LIGHT collaboration was founded (Laser Ion Generation, Handling and Transport). The collaboration consists of several university groups and research centers, namely TU Darmstadt, JWGU Frankfurt, HI Jena, HZDR Dresden and GSI Darmstadt. The central goal is building a test beamline for merging laser ion acceleration with conventional accelerator infrastructure at the GSI facility. In the latest experiments, low divergent proton bunches with a central energy of up to 10 MeV and containing $> 10^9$ particles could be provided at up to 2.2 m behind the plasma source, using a pulsed solenoid. In a next step, a radiofrequency cavity will be added to the beamline for phase rotation of these bunches, giving access to sub-ns bunch lengths and reaching highest intensities. An overview of the LIGHT objectives and the recent experimental results will be given.

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