

Status of the new Line for Laser-driven Light Ions Acceleration (L3IA) at ILIL and related TNSA studies

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A new laser-driven ion acceleration line is being developed at the Intense Laser Irradiation Laboratory, in the framework of the ILIL-PW installation upgrade which includes a 7J power amplifier, a new vacuum compressor and a remotely controlled vacuum beam transport line into a new, shielded target area. The new octagonal target chamber will host a dedicated line to deliver light ions accelerated by target normal sheath acceleration (TNSA) driven by laser irradiation of thin foils at an intensity exceeding 1020 W/cm². Current design of the TNSA configuration, including laser pulse and target specifications, is based upon the particle in cell modelling carried out using the Aladyn code and validated by an on-going experimental campaign carried out using current laser performance featuring 10 TW on target in a <40 fs laser pulse. A set of diagnostics of laser-plasma interaction and ion acceleration is also being developed to establish online optimization tools for the acceleration line. An overview will be given on the status of the ILIL-PW upgrade, the current experiments and the planned activity within the L3IA endeavour.

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