

Parametric study of proton-Boron fusion under direct laser irradiation

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Proton-Boron fusion has raised noticeable interest in the perspective of a reactor design due to its almost aneutronic nature and the abundance of the reactants. This mechanism is also envisaged as a possible bright source of alpha particles for medical or fundamental purposes. From Particle-In-Cell simulations and post-processing analyses we review the expected nuclear reaction events and channel types in several laser-target configurations in the ps regime. In particular, we seek to evaluate the role of pre-plasma stemming from intense laser pulses and limited contrast ratio as well as the influence of target design on the yields. We also discuss differences with the indirect pitcher-catcher scheme and present limitations and perspectives of our approach.

Auteur principal: CAIZERGUES, Clément (CELIA)

Co-auteurs: NICOLAÏ, Philippe (CELIA); D'HUMIÈRES, Emmanuel (CELIA); RAFFESTIN, Didier (CELIA); MORACE, Alessio (Institute of Laser Engineering, Osaka University); BATANI, Dimitri (CELIA)

Orateur: CAIZERGUES, Clément (CELIA)

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