



Contribution ID: 105

Type: **Posters**

Diagnostics improvement in the ABC facility and preliminary tests on a laser-cluster experiment

Tuesday, 29 November 2011 14:43 (1 minute)

The research on Inertial Confinement Fusion (ICF) is mainly developed using high power laser facilities. In this context the diagnostics of particle flows is a delicate issue, due to the fast timescales and to the strong electromagnetic and radiative contributions. The discrimination of the different particles emitted by the plasma is therefore not trivial, and it requires the use of several diagnostic techniques. The ABC facility employs a two beams 100J/4ns Nd phosphate glass laser which can be focused up to about 1015 W/cm² on targets, from opposite sides, for investigation of high density plasmas. The experimental chamber is equipped with diagnostics for the measurement of the main plasma characteristics and for the evaluation of the target acceleration stability. In this contribution we describe the diagnostics improvement, which will provide a more detailed analysis of the particles and of the electromagnetic fields originating from the interaction of the laser with targets foreseen for future experiments. We also discuss the use of metal strips and diamond detectors to achieve a time resolved diagnostics of the particle flows.

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Session Classification: Poster Session: presentation of posters