

Cluster ion beam for ICF: a Renewal

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Abstract: We presently witness a reappraisal of concern for the Cluster Ion Beam (CIB) approach to heavy ion driven Inertial Confinement Fusion (ICF).

Our purpose is to elaborate on a very recent proposal switching from C_{60}^{n+} linear acceleration [1,2] to circular acceleration of Si_{100}^{8+} ; making use of a suitable extension of the relativistic electron Microtron to GeV acceleration of very heavy particles [3].

This program is currently developed on the KEK facility (Ibaraki, Japan). Then we intend to emphasize the specific features of the CIB - dense plasma target stopping of the resulting ion debris leading to a very significant reduction of CIB ranges in pellet outer shells.

As a result, the Direct Drive approach could be managed through a much higher hydro compression while the Indirect one would highlight a much higher adiabat with radiative temperature in the 500–600 eV range.

A specific attention will also be given to the pertaining cluster ion source design.

We also address the very efficient laser conditioning of the Coulomb explosion [4].

References

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