Contribution ID: **95** Type: **Poster**

Harmonic analysis of irradiation asymmetry for cylindrical implosions driven by high-frequency rotating ion beams

Thursday, 16 August 2012 14:35 (2h 40m)

A. Bret (1,2,3); A.R. Piriz (1,2); and N.A. Tahir (4)

(1) Universidad de Castilla–La Mancha, Ciudad Real, Spain
(2) Instituto de Investigaciones Energéticas y Aplicaciones Industriales, Ciudad Real, Spain
(3) Harvard CfA, Cambridge, MA
(4) GSI Darmstadt, Germany

Cylindrical implosions driven by intense heavy ion beams should be instrumental in the near future to study high-energy-density matter. By rotating the beam by means of a high-frequency wobbler, it should be possible to deposit energy in the outer layers of a cylinder, compressing the material deposited in its core. The beam' s temporal profile should, however, generate an inevitable irradiation asymmetry likely to feed the Rayleigh-Taylor instability (RTI) during the implosion phase.

We compute the Fourier components of the target irradiation in order to make the connection with previous works on the RTI performed in this setting. Implementing one- and two-dimensional beam models, we find that these components can be expressed exactly in terms of the Fourier transform of the temporal beam profile. If T is the beam duration and Omega its rotation frequency, "magic products"Omega*T can be identified which cancel the first harmonic of the deposited density, resulting in an improved irradiation symmetry.

A. Bret, A.R. Piriz, and N.A. Tahir, Physical Review E 85, 036402 (2012)

Primary author: BRET, A. (Universidad de Castilla)

Presenter: BRET, A. (Universidad de Castilla)

Session Classification: Poster session