Contribution ID: **242** Type: **talk**

Controlling ion acceleration and RPA with carbon nanofoam targets

Tuesday, 15 September 2015 18:00 (25 minutes)

Carbon Naotube Foam (CNF) allows the controlled formation of near critical density plasmas over tightly defined spatial intervals and steep gradients. These unique characteristics make
it a powerful new tool for the control of laser plasma interactions. When a laser propagates through CNF, the laser pulse front is steepened substantially and even lasers with high numerical aperture undergo rapid self focusing on micron scale distances. The results is an ultrasteep risetime pulse with substantially enhanced intensity. In particular the combination of CNF with a solid density target is shown to lead to enhanced ion acceleration, with particular improvement on the heavy ion species.
Similarly, CNF are excellent for controlling the group velocity mismatch between laser and accelerated ion bunch. For the correct intensity, very strong shaping and enhanced energy gain is predicted, lowering the threshold for the transition to Radiation Pressure dominant acceleration substantially. Experimental and theoretical results are presented.

Primary author: ZEPF, Matt (Helmholtz Institut Jena and Queen's University Belfast)

Presenter: ZEPF, Matt (Helmholtz Institut Jena and Queen's University Belfast)

Session Classification: WG2 - Ion beams from plasmas

Track Classification: WG2 - Ion beams from plasmas