Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Mitigation of Raileigh-Taylor instability in low-density foam target TAKESHI WATARI, MITSUO NAKAI, KEIJI NAGAI, HIROSHI AZECHI, HIROYUKI SHIRAGA, KEISUKE SHIGEMORI, TATSUHIRO SAKAIYA, KAZUTO OTANI, NORIMITSU MAHIGASHI, KAZUO TAKEDA, SHINSUKE FUJIOKA, KUNIOKI MIMA, ILE, Osaka University — In the recent laser fusion program, foam cryogenic targets have been developed as promising targets which have a great potential to realize an efficient nuclear fusion. The 'foam' is porous plastic material which has a microstructure inside. We have studied hydrodynamics of the foam as low-density ablator. We observed the hydrodynamic instability on the foam target. If the low density foam is used as an ablator, the Rayleigh-Taylor (RT) instability growth is expected to be mitigated. If we using low-density foam targets, because of it's low density, we get the lower peak density of the ablation front and longer density scale length at the ablation front than the polystyrene (CH) targets. In order to demonstrate this reduction, we have started an experiment to observe the RT instability and peak density of the ablation front at the target accelerated by using a planar low-density foam target with initial surface perturbation, and this experimental result are compared with those of the experiment with using CH target. This comparison result indicates the mitigation of the RT instability by using low density ablator.

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Date submitted: 24 Jul 2005 Electronic form version 1.4