

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Ion heating regimes for PW laser plasma interaction TITO MENDONCA, PETER NORREYS, ROBERT BINGHAM, Rutherford Appleton Laboratory, J.R. DAVIES, IST Lisbon — We explore the possible occurrence of preferential ion heating regimes for ultra intense laser plasma experiments, pertinent to fast ignition. We consider a coupled two-step mechanism, which is based on the excitation of an electron two stream instability, driven by a fast electron beam. This creates a secondary beam of low group velocity plasmons that is modulationally unstable and resonantly decays into ion acoustic waves. These low frequency waves are then strongly damped by ion collisions in the dense plasma core. Such a model provides a simple explanation for the preferential heating of the bulk ion population observed in recent PW laser experiments.

Robert Bingham
Rutherford Appleton Laboratory

Date submitted: 24 Jul 2005

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