

Abstract Submitted
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Ten times higher laser ablation efficiency by nonlinear force driven plasma blocks HEINRICH HORA, Dept. of Theoretical Physics, Univ. of New South Wales, GEORGE MILEY, Depr. of NPPE, Univ. of IL, U-C Campus — A significant anomaly at ps. TW laser interacting with plasma was observed based on the suppression of relativistic self-focusing [1,2]. Highly directed low temperature plasma blocks (pistons) are generated by acceleration by the nonlinear (ponderomotive) force. This directly converts optical energy into hydrodynamic motion with little thermal loss due to unavoidable collisions. Instead of the usual 5% ablation efficiency for plasma compression using thermalization, this direct energy conversion mechanism permits 50% ablation efficiency as predicted at spherical compression for fusion [3]. From detailed experiments and computations [2] it can be concluded that irradiated DT fuel shells even may not need the initially pre-irradiation generally assumed [3]. The directivity of the imploding shells permits various options for fusion reactions in the compressed plasma.

- [1] H. Hora, J. Badziak et al. Opt. Commun. 207, 333 (2002).
- [2] H. Hora, J. Badziak et al. Phys. Plasmas 14, 072701 (2007).
- [3] H. Hora, Nucl. Inst. and Methods 144, 17 (1977).

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