

Abstract Submitted
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Deducing surprisingly small thermal ion energy content from spectral line shapes in an imploding z-pinch plasma¹ E. KROUPP, L. GREGORIAN, G. DAVARA, A. STAROBINETS, Y. MARON, Weizmann Institute of Science, A. FRUCHTMAN, Holon Institute of Technology, N.J. FISCH, Princeton University — Spectral broadening of emission lines of singly to five-times ionized oxygen are used to investigate the ion density and flow in the plasma during the implosion phase of a 0.6 μ s, 220 kA z-pinch experiment. Despite significant Doppler broadening of the lines, which indicates a large range of ion velocities, it can be deduced that this energy resides in fluid motion, rather than in thermal motion. The picture that emerges is that plasma, undergoing rapid implosion, supports large energies in turbulent fluid motion, but not in the relative motion of ions to each other or to electrons.

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