

Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Alfvénic jets associated with spheromak formation¹ DEEPAK KUMAR, PAUL BELLAN, California Institute of Technology — Collimated plasma jets flowing away from the electrodes are produced in the Caltech spheromak experiment. The jet formation stage precedes the spheromak formation and serves as a mechanism for feeding particles, magnetic helicity, energy and toroidal flux into the system. Detailed density and flow velocity measurements of hydrogen and deuterium plasma jets reveal that the flow velocity of these jets is Alfvénic with respect to the the toroidal magnetic field produced by the axial current within the plasma. A MHD model predicts how the flow velocity and plasma density scales with the electric current (D. Kumar and P. M. Bellan, Phys. Rev. Lett., to appear.). Visual images and magnetic field measurements indicate that the jet core is dense ($\beta \sim 1$), while the edge plasma is approximately force-free ($\beta \rightarrow 0$). These laboratory jets also provide useful insight into the acceleration and collimation of astrophysical jets associated with star formation.

¹Supported by USDOE.

Deepak Kumar
California Institute of Technology

Date submitted: 21 Jul 2009

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