

Abstract Submitted  
for the DPP12 Meeting of  
The American Physical Society

**Faster, Hotter MHD-Driven Jets Using RF Pre-Ionization** VERNON CHAPLIN, PAUL BELLAN, Caltech — We are studying MHD-driven jets relevant to spheromak formation and to astrophysical jets. Previous experiments at Caltech have focused on plasmas created by breaking down neutral gas using high voltage. The Paschen breakdown criterion governing this process sets an undesirable lower limit for the jet density. To overcome this constraint, we have designed and constructed a pre-ionization system powered by a pulsed 3 kW 13.56 MHz class D RF power amplifier. The RF amplifier is mounted on a compact printed circuit board and powered by AA batteries, allowing it to float at the high voltage of the center electrode of the jet experiment. The lower-density plasma jets created with the aid of RF pre-ionization are expected to be faster, hotter, and have higher Lundquist numbers than jets created by Paschen breakdown, opening up a new regime of study with increased relevance to astrophysics. The installation of the pre-ionization system on the MHD-driven jet experiment will be described, and details of the RF source operation and properties of the pre-ionized plasma will be summarized. Results from experiments with pre-ionized jets will be presented if available.

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Date submitted: 10 Jul 2012

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