Abstract Submitted
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The Basic Plasma Science Facility: a platform for studying plasma processes relevant to space and astrophysical settings[1] T.A. CARTER, UCLA — The Basic Plasma Science Facility at UCLA is a national user facility for studies of fundamental processes in magnetized plasmas. The centerpiece is the Large Plasma Device, a 20 m, magnetized linear plasma device. Two hot cathode plasma sources are available. A Barium Oxide coated cathode produces plasmas with $n \sim 10^{12}\text{cm}^{-3}$, $T_e \sim 5$ eV, T_i1eV with magnetic field from 400G-2kG. This low-β plasma has been used to study fundamental processes, including: dispersion and damping of kinetic and inertial Alfvén waves, flux ropes and magnetic reconnection, three-wave interactions and parametric instabilities of Alfvén waves, turbulence and transport, and interactions of energetic ions and electrons with plasma waves. A new Lanthanum Hexaboride (LaB_6) cathode is now available which produces significantly higher densities and temperatures: $n5\times10^{13}\text{cm}^{-3}$, $T_e \sim 12$eV, $T_i \sim 6$eV. This higher pressure plasma source enabled the observation of laser-driven collisionless magnetized shocks and, with lowered magnetic field, provides magnetized plasmas with β approaching or possibly exceeding unity. This opens up opportunities for investigating processes relevant to the solar wind and astrophysical plasmas.

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