Abstract Submitted
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Are ion acoustic waves supported by high-density plasmas in the Large Plasma Device (LaPD)? REBECCA ROYCROFT, SETH DORFMAN, TROY A. CARTER, WALTER GEKELMAN, SHREEKRISHNA TRIPATHI, University of California, Los Angeles — Ion acoustic waves are a type of longitudinal wave in a plasma, propagating though the motion of the ions. The wave plays a key role in a parametric decay process thought to be responsible for the spectrum of turbulence observed in the solar wind. In recent LaPD experiments aimed at studying this process, modes thought to be ion acoustic waves are strongly damped when the pump Alfven waves are turned off. This observation motivates an experiment focused on directly launching ion acoustic waves under similar conditions. Our first attempt to launch ion acoustic waves using a metal grid in the plasma was unsuccessful at high magnetic fields and densities due to electrons shorting out the bias applied between the grid and the wall. Results from a new device based on [1] to launch ion acoustic waves will be presented; this device will consist of a small chamber with a plasma source separated from the main chamber by two biased grids. The plasma created inside the small device will be held at a different potential from the main plasma; modulation of this difference should affect the ions, allowing ion acoustic waves to be launched and their properties compared to the prior LaPD experiments.

[1] W. Gekelman and R. L. Stenzel, Phys. Fluids 21, 2014 (1978).

Rebecca Roycroft
University of California, Los Angeles

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