

Abstract Submitted
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Measurement of Ion Temperature in a Laboratory Plasma¹ JI-ACHEN LIU, SETH DORFMAN, TROY CARTER, WALTER GEKELMAN, PATRICK PRIBYL, ANTON BONDARENKO, University of California, Los Angeles — Alfvén waves are low-frequency oscillating waves in a magnetized plasma. These modes may play a significant role in the heating of the solar corona, solar wind turbulence, and in fast ion transport in tokamaks. Effects that arise in a hot ion plasma are of particular interest; a new plasma source has been installed in the Large Plasma Device (LAPD) at UCLA to study this regime. In the present work, the ion temperature in this new plasma is measured using the width of the Helium ion spectral line emission. A monochromator is first used to measure cold ($\sim 0.1\text{eV}$) spectral lines of a mercury lamp to account for instrumental broadening. After acquiring this calibration data, we convolve it with plasma simulation (PrismSPECT) data for a series of known ion temperatures. The result is then compared to the actual plasma measurements to obtain the plasma ion temperature. Currently, we are working to implement a matching F-number lens system to improve the resolution of the spectral line. Results of these measurements will aid future Alfvén wave research in hot ion plasmas; this research may shed light on some of the plasma physics problems mentioned above.

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