

Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Study of Coupling between a Plasma Source and Plasma Fluctuations¹ JORGE BERUMEN, FENG CHU, RYAN HOOD, SEAN MATTINGLY, ANTHONY ROGERS, FRED SKIFF, The University of Iowa — An experimental study on the coupling between a plasma source and plasma fluctuations in a cylindrical, magnetized, singly-ionized Argon inductively-coupled gas discharge plasma that is weakly collisional is presented. Typical plasma conditions are $n \sim 10^{10} \text{cm}^{-3}$ $T_e \sim 3 \text{ eV}$ and $B \sim 1 \text{ kG}$. Amplitude Modulation (AM) of the inductively-coupled RF plasma source is produced near the fundamental-mode ion-acoustic wave frequency ($\sim 1 \text{ kHz}$) to study the effects of the source-wave interaction and plasma production. Density fluctuation measurements are implemented using Laser-Induced Fluorescence techniques and Langmuir probes. We apply coherent detection with respect to the wave frequency to obtain the perturbed ion distribution function associated with the waves. Measurements of fluctuating I-V traces from a Langmuir probe array and antenna current load are also used to show the effects of the interaction.

¹We would like to acknowledge DOE DE-FG02-99ER54543 for their financial support throughout this research.

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Date submitted: 11 Jul 2014

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