Abstract Submitted
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Ion beam generated modes in the lower hybrid frequency range in a laboratory magnetoplasma[1] BART VAN COMPERNOLLE, SHREEKRISHNA KP TRIPATHI, WALTER GEKELMAN, PATRICK PRIBYL, University of California, Los Angeles, PATRICK COLESTOCK, Los Alamos National Laboratories — The interaction of a fast ion beam with a low β plasma has been studied in the laboratory. Experiments were performed at the LArge Plasma Device (LAPD) at UCLA. The experiments were done in a Helium plasma ($n \simeq 10^{12}$ cm^{-3}, $B_0 =$ 1000 G - 1800 G, $f_{pe}/f_{ce} \simeq 1-5$, $T_e = 0.25$ eV, $v_{te} \ll v_A$). The ion beam is a Helium beam with energies ranging from 5 keV to 18 keV. The fast ion velocity is on the order of the Alfvén velocity. The beam is injected from the end of the machine, and spirals down the linear device. Waves were observed below f_{ci} in the shear Alfvén wave regime, and in a broad spectrum above f_{ci} in the lower hybrid frequency range, the focus of this paper. The wave spectra have distinct peaks close to ion cyclotron harmonics, extending out to the 100th harmonic in some cases. The wave generation was studied for various plasma parameters, as well as for different beam energies and pitch angles. The waves were measured with 3-axis electric and magnetic probes. Detailed measurements of the perpendicular mode structure will be shown. Langmuir probes were used to measure density and temperature evolution due to the beam-plasma interaction. Retarding field energy analyzers captured the ion beam profiles.

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