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Ion beam generated modes in the lower hybrid frequency range in a laboratory magnetoplasma[1] BART VAN COMPERNOLLE, SHREEKRISHNA TRIPATHI, WALTER GEKELMAN, PATRICK PRIBYL, UCLA — 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, $f_{pe}/f_{ce} \simeq 1 - 5$, $T_e \simeq 4$ eV, $v_{te} \ll v_A$). The ion beam is either a Helium beam or Hydrogen 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 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 2D perpendicular mode structure will be shown. Progress on a theoretical framework of the wave generation by the ion beam will be presented along with comparisons to the measured wave properties.

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