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**Characterization of Waves Propagating Parallel and Anti-Parallel Downstream of a High Power Helicon Source** JAMES PRAGER, TIM ZIEMBA, RACE ROBERSON, ROBERT WINGLEE, University of Washington — Measurements of the wavelength and phase velocity of waves propagating downstream of a helicon source were found to deviate significantly from the expected values based on a bounded helicon wave and matched more closely with that of a freely propagating whistler wave. The data also revealed significant differences in the measured wave fields between when the antenna was driving waves parallel and anti-parallel to $B_0$. These waves are correlated with the ion acceleration detected over a large axial distance, distinguishing this effect from acceleration through a double layer. Radial measurements of the wave fields propagating parallel and anti-parallel show differences in radial confinement of the waves with the profile changing from peaking on axis to maximizing at the edges of the plasma stream. Detailed results of magnetic field measurements taken both axially and radially with 3-axis bdot probes will be presented, and these measurements will be supplemented with plasma density measurements from Langmuir probes and ion energy analyzer results.

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