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Ion distribution function perturbations due to propagating Alfven waves. SAEID HOUSHMANDYAR, EARL SCIME, CHRIS COMPTON, West Virginia University — A number of mechanisms for ion heating in the fast solar wind have been proposed. For example, the ions could be directly heated by ion-cyclotron damping of Alfven waves or counter-propagating, low-frequency, Alfven waves could generate a turbulent cascade that heats ions by exciting higher frequency waves that then damp on the ions. In this preliminary study, we report measurements of shear Alfven wave propagation and damping at wave frequencies near the ion cyclotron frequency. The low amplitude waves are excited by a steady state loop antenna immersed in high-density, argon and helium, helicon source plasmas. The propagating waves were detected with an absolutely calibrated magnetic pick up coil located 30 cm downstream from the launching antenna. The experiments were conducted in the West Virginia University HELIX (Hot hELIcon eXperiment) device. In argon plasma, perturbations of the ion velocity space distribution due to the Alfven wave are measured with laser induced fluorescence and compared to theoretical predictions.

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