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Alfvén Wave Propagation in Strongly Inhomogeneous Partially Ionized Plasmas in the *Hot hELicon eXperiment (HELIX)* STEPHANIE SEARS, JERRY CARR JR., MATTHEW GALANTE, RICHARD MAGEE, DUSTIN MCCARREN, GREGORY LUSK, ROBERT VANDERVORT, EARL SCIME, West Virginia Univeristy — Alfvén wave damping is one of the most important mechanisms for understanding ion heating in the solar corona. The presence of ion-neutral collisions in partially ionized plasmas, such as the chromosphere, has a significant but not well-understood effect on Alfvén wave propagation and energy transfer. Since the neutral density in HELIX varies strongly with radius, a wide range of Alfvén dynamics can be studied across the plasma column and the effects of changing the ion-neutral collision frequency can be observed. The ratio of the ion-neutral collision frequency to the ion-cyclotron frequency in HELIX varies from about 0.02 to 0.5 across the plasma column. In the solar atmosphere this ratio varies from approximately 10^{-6} to 10. With the use of a low-frequency wave-launching antenna and a small-scale (smaller than the ion gyroradius) magnetic sense coil probe, the behavior of radially confined Alfvén waves is measured and characterized. These observations, coupled with LIF measurements of the plasma temperature and drift, are compared to observations in the corona.

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