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Ion Heating Due to Low-Frequency Wave Propagation in Partially Ionized Plasmas With a Strong Density Gradient in the Hot Helicon Experiment (HELIX) STEPHANIE SEARS, ROBERT VANDERVORT, GREG LUSK, MARK SODERHOLM, JOHN MCKEE, EARL SCIME, West Virginia University — Ion heating is observed in the solar corona but is still poorly understood. Alfvén wave damping is one of the most plausible mechanisms proposed to explain coronal ion heating. With time-resolved Laser Induced Fluorescence (LIF), we have measured the increase in ion temperature in HELIX in the presence of low-frequency waves generated by a small antenna near the high-density core. We have taken LIF measurements across the plasma column to characterize how the local density and density gradient affect ion heating. Wavelet analysis of localized, small-scale (smaller than an ion gyroradius) magnetic probe measurements suggest that plasma turbulence also plays a role in ion heating.

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