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Neutral Density Profile Measurement in a Helium Helicon Plasma and its Effect on Alfvén Waves Dispersion SAEID HOUSHMANDYAR, MATTHEW GALANTE, EARL SCIME, West Virginia University — Recently we developed a novel technique to measure the neutral density in a helium plasma using laser induced fluorescence and the plasma opacity [*Houshmandyar et al.*, Rev. Sci. Instrum. Oct 2010]. Knowledge of neutral density profile provides insight into the propagation of shear Alfvén waves in partially ionized plasmas; in which finite ion-neutral collisions radically alter the wave characteristics, *i.e.*, the dispersion relation. Here we report an extension to our earlier work, including measurements of the neutral density at different radial positions for two gas flow configurations, continuous inlet flow and static (no flow). Also, we show that the measured values of neutral densities at different radii are in good agreement with of those deduced from the kinetic Alfvén dispersion relation when measured at different radii.

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