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Neutral Helium Profile Measurements in the WVU Helicon Source AMY KEESEE, ROBERT HARDIN, EARL SCIME, SPENCER CONNOR, West Virginia University — We report spatially resolved measurements of excited state neutral helium density, temperature, and flow velocities in the WVU helicon plasma source (HELIX). While ion dynamics are studied extensively, neutral particle characteristics such as density and temperature are frequently neglected in low temperature plasmas and assumed to be spatially uniform. Measurement of the neutral flow is also important, specifically for researchers who use line integrated spectroscopy, since flows along the line of sight can artificially broaden the line width of emission lines. Recent work by Holland *et al.* on spontaneous flow shear illustrates the need for spatially resolved measurement profiles of the neutral particle parameters. Inclusion of a spatially varying ion-neutral momentum dampening parameter in theoretical models would not only give a more comprehensive understanding of the physics, but could lead to increased shear. Profile measurements were made using the 2D stage described in Hardin *et al.* C. Holland, J. H. Yu, A. James *et al.*, Phys. Rev. Lett. 96, 195002 (2006). R. Hardin, X. Sun, E. Scime, Rev. Sci. Instrum. 75, 4091 (2004).

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