

Abstract Submitted  
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**Coherence Imaging Spectroscopy Characterization on the CTH and W7-X Experiments**<sup>1</sup> N.R. ALLEN, D.A. ENNIS, G.J. HARTWELL, C.A. JOHNSON, D.A. MAURER, Auburn Univ, C.M. SAMUELL, S.L. ALLEN, LLNL, D. GRADIC, R. KNIG, V. PERSEO, W7-X TEAM, IPP Greifswald — Two-dimensional profiles of line-integrated impurity emissivity and velocity in the Compact Toroidal Hybrid (CTH) experiment are obtained with Coherence Imaging Spectroscopy (CIS), a polarization interferometry technique with fixed delays. To characterize the optical setup, CIS observations are benchmarked against Doppler-shifted spectroscopy measurements. Spectroscopy confirmed toroidal He<sup>+</sup> flows of 10-15 km/s while also identifying contaminating lines within the CIS spectral filter and associated errors. Additionally, two CIS instruments investigating the 3D physics of the W7-X island divertor provide ion flow measurements in orthogonal directions. A continuously tunable laser and wavemeter supply an absolute reference during W7-X plasma operations to simplify analysis and allow for measurements of multiple ion species. He<sup>+</sup> flow profiles and their comparison to C<sup>+</sup> flow structures in the W7-X divertor will be presented.

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Nicholas Allen  
Auburn University

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