Advances in Velocimetry Techniques for Plasma Turbulence Studies[1] T. MUNSAT, Y. SECHREST, University of Colorado — The HOP-V (Hybrid OPtical-flow Velocimetry) code, developed for extracting time-resolved 2-D velocity maps from turbulence imaging diagnostics, combines optical-flow and local pattern-matching techniques to derive "dense" velocity fields at the full time resolution and a fraction of the spatial resolution of the underlying image frames, often tens of pixels per side and thousands of timepoints in duration, with resolution sufficient to resolve the relevant turbulent structures. Here we discuss recent advances in the techniques for extracting velocity fields, as well as a number of applications related to analysis of turbulence and its interaction with plasma flow. As part of this study, we have implemented a synthetic diagnostic (similar to the Gas Puff Imaging instrument) to analyze the output of the BOUT and SOLT edge turbulence codes, enabling direct comparison to the known plasma quantities from the simulation, in an attempt to define the connection between the observed velocities and underlying turbulent plasma behavior. In this talk, we discuss recent velocimetry analysis of both numerical simulations and experiments.

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