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**Velocity-space cross-correlation matrix measurements and potential applications to space plasmas** SEAN MATTINGLY, FRED SKIFF, University of Iowa — We summarize a recent laboratory measurement of a velocity - space cross correlation matrix. This matrix can be decomposed into a set of eigenmodes that can be compared to plasma kinetic fluctuation modes. The measurement is a local measurement that may be applied with any velocity-sensitive measurement technique. In the laboratory, this measurement is achieved with laser induced fluorescence. In the spirit of this miniconference, we discuss the criteria a velocity-sensitive measurement must fulfill for a velocity-space cross-correlation measurement to be taken *in situ* in space plasma.

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