Inferring accurate velocity fields from turbulence diagnostics

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Despite the fact that image velocimetry techniques have led to valuable insights into the dynamics of tokamak plasmas, previous literature has largely neglected the uncertainties and measurement limits associated with these techniques. In the work presented here, systematic tests have been performed to quantify the accuracy and precision of the two main velocimetry techniques - Cross Correlation Time Delay Estimation (CCTDE) and Dynamic Time Warping (DTW). These to the limit tests were performed with the aim of providing a complete picture of the technique performance under a wide variety of data inputs and to allow straightforward velocimetry optimisation for experimental application.

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