

Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

A study of the sensitivity of the POD eigenvalues to the density of the resolved measurement grid. CHARLES TINNEY¹, University of Texas at Austin — A study of the sensitivity of the convergence of the POD eigenvalues to the discretization of the measurement / computational grid is presented using a number of different experimental data sets. The purpose is to determine the necessary conditions, based on an a priori understanding of the statistical properties of the turbulence field, for sufficiently obtaining a reduced order representation of the system. The analysis is important for two reasons. The first is that when the grid resolution is too coarse, the first few POD eigenvalues are overestimated followed by underestimates in the higher POD eigenvalues. Conversely, for grid resolutions that are too dense, superfluous information is carried. Where the latter is concerned, the performance of physics based control architectures that are designed around low-dimensional analysis tools can be seriously hindered.

¹Assistant Professor

Charles Tinney
University of Texas at Austin

Date submitted: 04 Aug 2008

Electronic form version 1.4