

3D07: POD-BASED ANALYSIS OF CYCLE-TO-CYCLE VARIATIONS IN AN OPTICALLY ACCESSIBLE DIESEL ENGINE.

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Comment by Matthew Dunn, The University of Sydney, Australia

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Thank you for your excellent presentation and original ideas for the uses of POD in analyzing experimental data. My question is: Do you believe that you have collected enough samples to demonstrate convergence of the POD modes? Reduced order modeling techniques can be particularly sensitive to small sample sizes and insufficiently converged POD modes from which the reduced order model coefficients are derived.

Reply by Gaetano Continillo

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In our case we use non-truncated decomposition and thus reconstruction of the experimental data is exact and there is no recourse to the concept of convergence. The sample size however is relevant to the statistic analysis we describe at the end of the paper, according to concepts explained in [24] of the paper. Indeed, discrimination between coherent (non-Gaussian) and incoherent (Gaussian) modes is made by means of a test that takes into account the sample size.