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POD Mode Coupling from Two-Plane PIV Measurements of the Turbulent Round Jet AZUR HODZIC, CLARA VELTE, Technical University of Denmark, WILLIAM GEORGE, Imperial College London — Independent PIV measurements were performed in the streamwise- and crossplane of the turbulet axi-symmetric jet and the flow field was decomposed using the Lumley Projection approach in order to reveal the most dominant features of the flow [1,2]. However, in order to achieve a full spatial decomposition and to be able to couple the streamwise- and cross plane modes successfully, simultaneous PIV measurements in the streamwise- and crossplane of the jet are being acquired in the current work. These measurements provide opportunities to reveal dominant three-dimensional structures, their role in the energy production, their interactions to compose the flow field and reveal the energy transport phenomena characteristic of this particular flow. The experimental results are compared to DNS results of the turbulent jet performed with state of the art methods allowing high Reynolds-number simulations and providing the opportunity to verify the experimental data. Current status presentations of the experimental- and DNS results will be given.

[1] Hodžić, PIV Measurements on Turbulent Jets, Master's thesis 2014.
[2] Wänström, Spatial decompositions of a fully-developed turbulent round jet sampled with particle image velocimetry, Ph.D dissertation 2009

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