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Dynamic Mode Decomposition of numerical and experimental data PETER SCHMID, LadHyX, Ecole Polytechnique, JOERN SESTERHENN, Univ. Bundeswehr Munich — The extraction of dynamically relevant structures from time-resolved flow data has commonly be restricted to numerically generated flow fields. Equivalent structures, however, could not be obtained from experimental measurements, since the commonly used mathematical techniques required the explicit or implicit availability of an underlying model equation. A numerical scheme based on a Krylov subspace method for the extraction of dynamic modes directly from flow fields — without the need to resort to a model equation — will be introduced. This technique can be applied equally to numerically generated or experimental data and thus provides a means to decompose time-resolved measurements into dynamically dominant structures. The treatment of subdomains, spatially evolving flows, PIV data and simple flow visualizations will be demonstrated; a connection to the proper orthogonal decomposition (POD) technique, which is a byproduct of the dynamic mode decomposition, will be pointed out.

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