

Abstract Submitted
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Motivation and development of the time-averaged active model-splitting hybrid RANS/LES¹ SIGFRIED HAERING, Argonne National Laboratory, TODD OLIVER, Oden Institute for Computational Engineering and Sciences, RAMESH BALAKRISHNAN, Argonne National Laboratory, ROBERT MOSER, Oden Institute for Computational Engineering and Sciences — We discuss motivation and development of the time-averaged active model-split (TAMS) hybrid RANS/LES approach. TAMS has been specifically constructed to overcome challenges associated with existing hybrid approaches related to LES/RANS blending techniques and inconsistencies between the resolved and modeled turbulence. Core to TAMS is a hybridization strategy in which the RANS and LES components act through separate models formulated using the mean and fluctuating velocity, respectively, as approximated by time averaging over the local turbulent timescales. Justification for this splitting strategy is discussed based on true subgrid terms from filtered DNS and simple LEVM arguments. Multiple validation cases are used to demonstrate the potential of the method.

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