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A Two-Stage Procedure Toward the Efficient Implementation of Pans and Other Hybrid Turbulence Models

By -

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 22 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. The main objective of this article is to introduce and to show the implementation of a novel two-stage procedure to efficiently estimate the level of scale resolution possible for a given flow on a given grid for Partial Averaged Navier-Stokes (PANS) and other hybrid models. It has been found that the prescribed scale resolution can play a major role in obtaining accurate flow solutions. The first step is to solve the unsteady or steady Reynolds Averaged Navier-Stokes (URANSRANS) equations. From this preprocessing step, the turbulence length-scale field is obtained. This is then used to compute the characteristic length-scale ratio between the turbulence scale and the grid spacing. Based on this ratio, we can assess the finest scale resolution that a given grid for a given flow can support. Along with other additional criteria, we are able to analytically identify the appropriate hybrid solver resolution for different regions of the flow. This procedure removes the grid dependency issue that affects the results produced by different hybrid procedures in solving unsteady flows. The formulation, implementation methodology, and validation example are presented. We implemented...



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