

Abstract Submitted
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Towards an improved interface treatment in Hybrid RANS-LES methods BHARANIDHARAN RAJAMANI, JOHN KIM, Univ. California Los Angeles — Almost all hybrid RANS-LES methods are confronted with the problem of having a proper interface treatment. In the case of DES, in which the same eddy-viscosity transport equation is solved throughout the domain, the RANS-LES interface has pronounced effects on the overall result. Since the interface is usually determined by the computational grid, this places much emphasis on the grid used. Several investigators have explored different interface treatments. Examples include adding a forcing term, specifying a better boundary condition at the interface, or changing the length scale such that the interface moves as the flow evolves. Our own research effort initially focused on moving the interface in such a way that the production and destruction of eddy viscosity always balances at the interface. In another approach, we used a narrow buffer near the interface allowing a smooth transition of eddy viscosity from high RANS values to low LES values. Recently, Germano proposed a hybrid filter which when applied to the Navier-Stokes equation allows smooth blending of RANS and LES models without the need of an interface treatment. Numerical results from some of these approaches will be presented.

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