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A posteriori analysis of numerical errors in transport equation models for subfilter scalar variance[1] COLLEEN M. KAUL, VENKAT RAMAN, The University of Texas at Austin — Conserved-scalar based large eddy simulations (LES) of non-premixed combustion require accurate models for subfilter scalar variance. Because most subfilter variance models depend strongly on the smallest resolved scales, they are susceptible to large numerical errors when calculated using finite difference methods. To evaluate models based on solution of a variance transport equation, errors must be assessed in a dynamic framework. The current work presents the results of a versatile a posteriori analysis method using modified wavenumbers to emulate finite difference errors in a pseudospectral code. Filtered scalar and variance fields corresponding to schemes of varying accuracy are evolved along with DNS velocity and scalar fields. This approach permits discretionary inclusion of various error sources, allowing detailed characterization of numerical and modeling issues in transport equation based subfilter variance prediction.

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