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A dynamic approach for nonequilibrium modeling of subfilter scalar dissipation rate in combustion LES COLLEEN M. KAUL, VENKAT RAMAN, The University of Texas at Austin — The filtered scalar dissipation rate is a fundamental parameter in combustion LES, appearing as an input parameter in all combustion models. Since subfilter dissipation is a small scale quantity, conventional dynamic modeling approaches are not valid. Typically, this quantity is obtained by assuming that the production of scalar variance at filtered scales is exactly balanced by dissipation, leading to an algebraic relation for the dissipation rate. However, this local equilibrium assumption is highly restrictive since it neglects spatial transport. Here, we propose a new modeling approach that overcomes this limitation. This nonequilibrium model uses a dynamic approach along with the scalar variance transport equation to determine the dissipation rate. *A priori* studies using DNS are used to evaluate the accuracy of the method. In addition, a novel *a posteriori* method is used to assess model performance in LES calculations.

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