LES-Modeling of a Partially Premixed Flame using a Deconvolution Turbulence Closure[1] QING WANG, HAO WU, MATTHIAS IHME, Stanford University — The modeling of the turbulence/chemistry interaction in partially premixed and multi-stream combustion remains an outstanding issue. By extending a recently developed constrained minimum mean-square error deconvolution (CMMSED) method, to objective of this work is to develop a source-term closure for turbulent multi-stream combustion. In this method, the chemical source term is obtained from a three-stream flamelet model, and CMMSED is used as closure model, thereby eliminating the need for presumed PDF-modeling. The model is applied to LES of a piloted turbulent jet flame with inhomogeneous inlets, and simulation results are compared with experiments. Comparisons with presumed PDF-methods are performed, and issues regarding resolution and conservation of the CMMSED method are examined.

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