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**Large Eddy Simulations of biodiesel spray flames using Flamelet Generated Manifolds** CONSTANTIN SULA, Universite catholique de Louvain, HOLGER GROSSHANS, Physikalisch-Technische Bundesanstalt, MILTIADIS PA-PALEXANDRIS, Universite catholique de Louvain — In this work, we report on Large-Eddy Simulations of biodiesel spray combustion. An Eulerian-Lagrangian approach is used to handle the motion of the gaseous and liquid phases. Further, the Flamelet Generated Manifolds (FGM) technique accounts for the turbulence-chemistry interaction. For the breakup of the fuel droplets, we utilize our modified version of the Taylor Analogy Breakup model and evaluate its impact on the overall combustion process. The numerical setup follows closely the Spray A operating condition defined by the Engine Combustion Network. However, the fuel used in our simulations is methyl butanoate, which is a suitable candidate to represent the ester content in biodiesel surrogates. By comparison with standard benchmarks, we determine the potential of the implemented numerical approach to evaluate spray combustion of new sustainable fuel types.

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