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Sensitivity Analysis to Turbulent Combustion Models for Combustor-Turbine Interactions KENJI MIKI, JEFF MODER, MENG-SING LIOU, NASA Glenn Research Center — The recently-updated Open National CombustionCode (Open NCC) equipped with a large-eddy simulation (LES) is applied to model the flow field inside the Energy Efficient Engine (EEE) in conjunction with sensitivity analysis to turbulent combustion models. In this study, we consider three different turbulence-combustion interaction models, the Eddy-Breakup model (EBU), the Linear-Eddy Model (LEM) and the Probability Density Function (PDF) model as well as the laminar chemistry model. A comprehensive comparison of the flow field and the flame structure will be provided. One of our main interests is to understand how a different model predicts thermal variation on the surface of the first stage vane. Considering that these models are often used in combustor/turbine communities, this study should provide some guidelines on numerical modeling of combustor-turbine interactions.

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