

Abstract Submitted
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Analysis of entropy generation in turbulent reacting flows using large eddy simulation MEHDI SAFARI, Miami University — The entropy transport equation is considered in large eddy simulation (LES) of turbulent reacting flows. This equation includes irreversible losses by entropy production due to viscous dissipation, heat conduction, mass diffusion and chemical reaction, all of which appear as unclosed terms. The closure is provided by entropy filtered density function (En-FDF) which includes the effect of chemical reaction in a closed form. An exact transport equation is developed for the En-FDF. The transport equation for En-FDF is modeled by a set of stochastic differential equations. The modeled En-FDF transport equation is solved by a Lagrangian Monte Carlo method. The methodology is applied to turbulent nonpremixed jet flames to analyze local entropy generation effects. Various modes of entropy generation are obtained and analyzed.

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