

عنوان مقاله:

Numerical Investigation of Influence of Flow Rates on Combustion Characteristics using Multiphase Flamelet Combustion

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خلاصه مقاله:

Numerical analysis plays vital role in designing gas turbine combustors for improving its performance. It requires deep understanding of turbulent and multiphase reactive flow physics inside the combustor. Hence present work focusses on numerical investigation of turbulent flow and reactive interaction between liquid spray of aviation kerosene droplets and air for the experimentally investigated combustor configuration. The present analysis results agree well with the experimental test results. Mixture fraction based Probability Density Function flamelet combustion model is used to solve transport equations by generating the flamelet library for Jet-A fuel. The analysis provides good insight into the multiphase combustion process and the flow phenomena occurring inside the combustor. Further, combustion performance characteristics at different design point operations are investigated in the present work keeping the air fuel ratio constant. Results show rise in peak velocity by ۲.۵ times and pressure loss factor by ۶ for design point .operating at higher flow rates in comparison with the baseline design operating point

کلمات کلیدی:

Mass flow rate, Mixture fraction, Performance parameter, Pattern factor, Pressure loss

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