Investigating the formation of temperature patterns in gas turbine engine combustion chambers

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The article investigates the flow pattern in the combustion liner of the combustion chamber. We defined the key factors having an impact on mixing the gas flows with the secondary air. The results of the composed analytical equations for the calculation of mixing allowed us to predict the level of the temperature field non-uniformity in the combustion chamber under various design and operating parameters at the inlet and determining the optimum flow ratios ensuring the minimum level of the temperature field non-uniformity at the combustion chamber output. We developed a computed 3D-model of the combustion chamber sector on the basis of which we analyzed the temperature field alterations at the output depending on the ratios between the input primary and secondary air into the combustion liner. The article compares the calculation data with the analytic dependences and experimental research.

Keywords: *gas-turbine engine, combustion chamber, temperature field non-uniformity , numerical simulation*

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