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超声速混合层混合LES/RANS模拟(PDF)

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Title: Numerical Simulation of Supersonic Mixing Layers by Hybrid LES/RANS Method

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关键词: [超声速混合层](#); [混合效率](#); [总压损失](#)

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摘要: 为明确超声速混合层发展规律, 利用混合LES/RANS方法计算了隔板厚度、压力不匹配程度及燃料组分对超声速混合层发展的影响, 并定量分析了相应的混合效率和压力损失。结果表明: 一定范围内, 隔板厚度越大, 混合越好, 总压损失越大; 压力不匹配程度与混合效率和压力损失并非线性关系, 总体而言, 不匹配程度越高, 混合效率相对较高, 总压损失较小; 氢气组分越靠近当量质量分数, 混合效率越高, 压力损失较大。

Abstract: In order to determine the discipline of the development of the supersonic mixing layer, the hybrid LES/RANS method was applied to simulate the influence of the clapboard thickness, the pressure mismatch degree and fuel components. Besides, the corresponding mixing efficiency and the total pressure loss were analyzed. The results suggest that within a certain range, the thicker the clapboard is, the higher the mixing efficiency and the total pressure loss are; the pressure mismatch degree is nonlinear to the mixing efficiency and the total pressure loss. In general, the higher the pressure mismatch degree is, the higher the mixing efficiency is and the lower the total pressure loss is; the nearer the hydrogen is to the equivalent mass fraction, the higher the mixing efficiency and the total pressure loss are.

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