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## 二元高超声速进气道的内压段设计

### Internal contraction tunnel design of two-dimensional hypersonic inlet

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英文关键词: [performance of inlet](#) [profile design](#) [internal contraction tunnel](#) [hypersonic inlet](#) [numerical simulation](#)

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中文摘要:

针对二元高超声速进气道, 采用不同张度的样条曲线设计内压段肩部型面. 在保持二元进气道内压段面积收缩比及喉道面积不变的条件下, 通过数值仿真研究了不同内压段长度、下壁面型面样条曲线张度对进气道性能的影响. 结果表明: 内压段的长度变化对进气道的气动及起动机能有较大影响, 当内压段长度与喉道高度比  $L/h_t$  为 8.4 左右时总压恢复系数较优; 采用合适张度的样条曲线代替传统的肩部圆弧过渡, 能够提高进气道总压恢复系数, 改善进气道起动机性能; 随着内压段长度增加, 其所对应的性能最优样条线张度值不断减小, 建议选取样条线张度值为 0.80~1.25.

英文摘要:

The curved surface of internal contraction tunnel of two-dimensional hypersonic inlet was designed and investigated. Based on hypersonic inlet with the same internal contraction area ratio and throat area, the influences of the length of internal contraction tunnel and the tension of the shoulder spline on the inlet performance were studied numerically. Results indicate that the length of internal contraction tunnel has great effect on the total pressure recovery coefficient and the starting-up Mach number. When the length to throat height ratio is 8.4, the total pressure recovery coefficient is better. Spline with suitable tension to replace the traditional surface with radii at shoulder can increase the total pressure recovery coefficient. With the increase of the length of internal contraction tunnel, the corresponding optimal tension of spline will decrease. The recommended range of spline tension is 0.80-1.25.

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