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## 星形装药发动机点火过程数值分析(PDF)

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Title: Numerical Analysis of Ignition Process for Star - shaped Charge Motor

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关键词: 星形装药; 点火瞬时过程; P - I 辐射模型

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摘要: 星形是固体火箭发动机常用的装药形式, 而其点火瞬时过程对发动机能否正常工作起着极为重要的作用。文中以Fluent软件为计算平台, 采用UDF编译来实现点火燃气和推进剂燃气的质量、动量、能量向燃烧室的注入, 结合  $k-\epsilon$  两方程湍流模型、P - I 辐射模型对某有堵盖的星形装药固体火箭发动机的点火瞬态过程进行三维数值计算。计算结果预示了各时刻下星形装药发动机燃烧室内的流场状态变化、火焰在星角内和轴向的传播规律。

Abstract: The star shape is a common charge type for use in solid rocket motor. Its ignition transient process plays an important role in determining whether a solid rocket motor can work normally. Fluent software was used as a calculation platform, and its UDF compiler was used to inject mass, momentum and energy of ignition gas and propellant gas into chamber. Combining with  $k-\epsilon$  two - equation turbulence model and P - I radiation model, the 3 - D numerical simulation of ignition transient process of some solid rocket motor with star - shaped charge and a cover was conducted. The results foreshow the flow field change in the star - shaped charge motor chamber and flame - spreading law in the star corner and longitude over time.

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