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翼柱形固体火箭发动机的优化设计

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OPTIMAL DESIGN OF FINNED TUBE SOLID ROCKET MOTOR

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摘要

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摘要 优化设计是固体火箭发动机CAD的重要环节,其优化设计是按照导弹的总体提出的战术和技术要求,朝着一定的设计目标经过多次的方案计算而选出的最佳参数。在已有的优化设计中常避开燃面计算,而计算一些简单形状的药柱(一维或二维)进行优化,因而不能适应目前广泛使用的三维空间。本文对翼柱形固体火箭发动机优化设计进行研究,以发动机的质量比冲为衡量标准,并进行了实例计算,结果令人满意。

关键词: 优化设计 翼柱装药 固体火箭发动机 计算机辅助设计

Abstract: The Optimal design is an important part of the CAD for solid rocket motor. This method is conducted by computer and is much better than traditional parameter selection by hand. It can also shorten the design and improve the calculating accuracy significantly. Based on the overall goal of tactic and technical demand of missile, the selection of optimal parameters of solid rocket motor is obtained through numerous calculations. In the existing optimal design material of rocket motor, the calculation of surface burning is always avoided and some simple shapes of solid grain (one dimension and two dimensions) are adopted. In this paper, an investigation of optimal design of the three dimensional solid grain (finned tube solid) is introduced. An example is given and its result is satisfactory.

Keywords: Optimal design Finned tube grain Solid rocket motor CAD

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