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低冰点推进剂对液体火箭发动机性能影响研究(PDF)

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Title: The Research on Influence of Low Freezing Point Propellant on Performance of Liquid - propellant Rocket Engine

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关键词: 低冰点推进剂; 液体火箭发动机; 单推三; MON; 拟合

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摘要: 针对低冰点推进剂在液体火箭发动机性能研究中的重要性, 对使用MON25/DT3组合的低冰点 推进剂液体火箭发动机的启动过程及稳态过程进行研究。建立了发动机系统的数学模型, 采用Matlab/Sim - ulink构造系统的仿真模型。根据仿真结果比较和分析了不同初温的推进剂对燃烧室压强、发动机比冲和推 力等各方面性能的影响, 得出了这三个参量与推进剂初温的拟合关系式。

Abstract: In view of the importance of low freezing point propellant in performance research of liquid - propellant rocket engine, the starting process and static - state process of a liquid rocket engine with MON - 25/DT - 3 low freezing point propellant were studied. The mathematical model of the engine system was built. Matlab/Simulink was utilized to build simulation model for the system. According to simulation result, three factors (i.e. pressure of combustion chamber, specific impulse and engine thrust) that were affected by initial temperature of propellant were compared and analyzed. The relationship between the propellant temperature and the factors were concluded.

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