

[Hide Expanded Menus](#)

王元, 李秋红, 黄向华. 变循环发动机建模技术研究[J]. 航空动力学报, 2013, 28(4):954~960

## 变循环发动机建模技术研究

## Research of variable cycle engine modeling techniques

投稿时间: 2012-05-08

DOI:

中文关键词: [变循环发动机](#) [风扇模型](#) [核心驱动风扇级模型](#) [共同工作方程](#) [模式切换](#)英文关键词: [variable cycle engine](#) [fan model](#) [core drive fan stage\(CDFS\) model](#) [co-working equations](#) [mode conversion](#)

基金项目: 航空科学基金(20110652003); 江苏省优势学科项目

作者	单位
<a href="#">王元</a>	<a href="#">南京航空航天大学 能源与动力学院, 南京 210016</a>
<a href="#">李秋红</a>	<a href="#">南京航空航天大学 能源与动力学院, 南京 210016</a>
<a href="#">黄向华</a>	<a href="#">南京航空航天大学 能源与动力学院, 南京 210016</a>

摘要点击次数: 321

全文下载次数: 598

中文摘要:

在对变循环发动机总体结构进行分析的基础上,参考双轴涡扇发动机部件模型的建立方法,建立了变循环发动机部件级数学模型,建立了区分叶根特性和叶尖特性的风扇部件模型,单外涵和双外涵模式的核心驱动风扇级数学模型。根据变循环发动机的特点,建立了反映变几何部件变化的稳态和动态共同工作方程。数字仿真结果表明:所建的变循环发动机模型能够实现工作模式之间的相互转换,并且在低空低马赫数双外涵模式下表现出了涡扇发动机特性,即高推力与低耗油率,而在高空高马赫数单外涵模式下相比涡扇模式提供的推力更大、耗油率更低,符合变循环发动机特点,验证了建模方法的可行性。

英文摘要:

The component level model of variable cycle engine (VCE) was built based on analysis of engine structure, and with a reference to the modeling method of two-spool-turbofan engine. The model of fan was developed with separated characteristic of fan tip and hub sections. The model of core drive fan stage(CDFS) model was built to work under single bypass mode and double bypass mode. According to the specialty of VCE, the static and dynamic co-working equations were set up, reflecting the variation of variable geometry components. The results of numerical simulation indicate that the VCE model enables switching of the working modes. In double bypass mode at low altitude and low mach number, it represents higher thrust and lower specific fuel consumption just as turbofan engine, and in single bypass mode at high altitude and high mach number, it shows higher thrust and lower specific fuel consumption just as turbojet engine. The performance variation in simulation accords with the specialty of VCE, so the modeling method of VCE proposed is feasible.

[查看全文](#) [查看/发表评论](#) [下载PDF阅读器](#)