论文

基于观测器的燃烧振荡鲁棒控制

陈星[1]，李东海[1]，朱民[1]，田玲玲[2]，王维杰[1]

1．清华大学热能工程系
2．北京航空航天大学自动化科学与电气工程学院

摘要：

介绍燃烧振荡的产生机理及控制原理，针对一个非线性燃烧振荡系统模型，在对简单移相控制器进行设计和分析的基础上，设计一个基于观测器的鲁棒控制器(observer based robust controller，ORC)。该控制器结构简单，设计过程不依赖于对象的数学模型，且对控制对象的参数变化具有一定适应性。分析和仿真结果表明，ORC能够产生移相效果从而抑制燃烧振荡，当燃烧系统偏离设计条件一定范围时，ORC仍能有效抑制振荡，具有较好的鲁棒性。

关键词： 燃烧振荡　鲁棒控制　观测器

Robust Control of Combustion Oscillation Based on Observer

CHEN Xing[1], LI Dong-hai[1], ZHU Min[1], TIAN Ling-ling[2], WANG Wei-jie[1]

1. Department of Thermal Engineering, Tsinghua University
2. School of Automation Science and Electrical Engineering, Beijing University of Aeronautics & Astronautics

Abstract:

The mechanism and control principle of combustion oscillation was introduced. Then，an observer based robust controller (ORC) was designed for a nonlinear combustion oscillation system based on the analysis and design of a simple phase-shift controller. This simple structure controller is adaptable to the change of the plant's parameters, and it can be designed without information of the combustion system. Both analysis and simulation results show that the ORC can achieve a phase-shift such to eliminate combustion oscillation, ORC can still work well at some off-design conditions, which means the robustness of ORC is good.

Keywords: combustion oscillation　robust control　observer

通讯作者: 陈星

作者简介：

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