

反应堆工程

温度反馈阶跃反应性输入下的燃料元件温度场分析

陈文振, 商学利, 张帆

海军工程大学 核能科学与工程系, 湖北 武汉 430033

收稿日期 2008-6-30 修回日期 2008-7-14 网络版发布日期: 2008-9-20

摘要 对燃料元件的非稳态温度场进行分析计算。结合反应堆物理、堆芯元件传热和与温度耦合的物性参数, 给出了物理数学模型。采用稳定的差分格式进行计算, 获得了有温度反馈阶跃反应性输入条件下的棒状燃料元件温度分布和变化规律, 计算结果的精度较高, 对堆芯热工设计与运行安全分析有参考价值, 特别是对处于经常变工况的核动力反应堆更有现实意义。

关键词 [温度场](#) [反应性](#) [中子动力学](#) [燃料元件](#) [温度反馈](#)

分类号 [TL326](#)

Analysis of Temperature Field of Fuel Element Under Conditions of Step Reactivity and Temperature Feedback

CHEN Wen-zhen, SHANG Xue-li, ZHANG Fan

Department of Nuclear Energy Science and Engineering, Naval University of Engineering, Wuhan 430033, China

Abstract The unsteady temperature field of fuel element was analyzed. Considering reactor neutron kinetics and heat transfer inside fuel element as well as the physical properties coupling temperature, the theoretical model was proposed. Using the steady difference method, the temperature variation and distribution in the cylindrical fuel element were obtained under the conditions of step reactivity and temperature feedback. The results are useful and significant for the thermal-hydraulic design and safety analysis of the nuclear reactor, especially for nuclear-powered reactors.

Key words [temperature field](#) [reactivity](#) [reactor](#) [neutron kinetics](#) [fuel element](#) [temperature feedback](#)

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