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反应堆工程

基于Simulink输入阶跃反应性时有温度和毒物反馈的反应堆动态响应仿真

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摘要 计算机仿真对核反应堆运行和核电人员的培训具有十分重要的意义。基于Simulink仿真软件，本工作对点堆中子动力学方程输入阶跃反应性考虑6组缓发中子时具有温度和毒物反馈的特性进行研究，计算了某型反应堆在两种典型工况下引入正、负阶跃反应性时各主要运行参数的变化规律，并将最终的结果与三维模型计算数据进行了对比。结果表明：利用Simulink进行点堆仿真研究能够高效、便捷地满足系统要求，且仿真结果与三维模型计算的数据符合得较好。

关键词 点堆；Simulink；温度反馈；毒物反馈

分类号

Dynamic Simulation of Response to Step Reactivity Inserted in Reactor With Temperature and Poison Feedback Based on Simulink

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Abstract

The computer simulation has very important significance for reactor operation and training operators. Based on Simulink, the characteristics of point reactor neutron kinetics equation with six groups delayed neutron were researched when a step reactivity was inserted in the reactor with temperature and poison feedback. Main parameters of a certain reactor were calculated under two typical operating conditions with positive and negative step reactivity. The results were compared with those obtained by 3 D simulation software of reactor. It is shown that the system requirement can meet efficiently and rapidly with Simulink.

Key words point reactor Simulink temperature feedback poison feedback

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