

反应堆工程

基于RELAP5的两管平行通道流动不稳定性研究

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摘要 利用RELAP5程序对垂直并联管中汽液两相流不稳定性实验装置进行了模拟, 并与实验工况进行比较, 结果表明: RELAP5程序的非平衡态两流体模型的计算结果与实验数据符合较好。并在此基础上研究了主要运行参数对两管平行通道管间脉动流动不稳定性的影响。结果表明: 入口欠热度对管间脉动的影响并非线性关系; 系统压力的增加可提高系统的稳定性并减小管间脉动的振幅; 进口节流增加, 系统的稳定性明显提高; 入口不均匀节流时两管总的极限热负荷升高; 不均匀加热时两管总的极限热负荷降低。

关键词 [并行通道](#) [流动不稳定性](#) [RELAP5程序](#)

分类号

Investigation on Two-Phase Flow Instability in Parallel Channels Based on RELAP5 Code

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Abstract Validation of the experiment of gas-liquid two phase flow instability in vertical parallel channel was performed by the best estimate system computer code RELAP5. The results calculated by the non-equilibrium two-fluid model of RELAP5 agree well with the experimental data. Based on these results, the effects of main operating parameters on the system behavior were studied. The results show that the effect of subcooling of inlet is nonlinear, and system pressure can increase the stability of the system and reduce the amplitude of oscillator, and the increasing of the inlet throttle improves the stability. With the dissymmetry degree of dissymmetry throttling increasing, the total critical heating power of oscillation is increased. With the dissymmetry degree of heated power increasing, the total critical heating power of oscillation is reduced.

Key words [parallel channel](#) [flow instability](#) [RELAP5 code](#)

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