

反应堆工程

摇摆运动条件下自然循环复合型脉动的实验研究

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摘要 对摇摆运动条件下的自然循环两相流动不稳定性进行实验研究。实验结果表明: 摇摆运动造成的两相流动不稳定性(波谷型两相流动不稳定性)和密度波型脉动相互叠加形成复合型脉动, 加剧了系统的两相流动不稳定性。复合型脉动分为不规则的复合型脉动和规则的复合型脉动两部分, 复合型脉动仅发生在高欠热度区域。规则的复合型脉动发生边界与相同热工水力参数下的密度波型脉动边界接近且受摇摆参数影响较小。

关键词 [摇摆运动](#) [流动不稳定性](#) [密度波型脉动](#) [复合型脉动](#) [自然循环](#)

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Experimental Research on Natural Circulation Complex Oscillations Under Rolling Motion Conditions

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Abstract Natural circulation flow instability under rolling motion conditions was experimentally studied. Experimental results show that the complex flow oscillations are formed due to the overlapped effect of the rolling motion (trough instability) and density wave oscillation. The system becomes more instable because of the occurrence of complex flow oscillations. Complex flow oscillations only occur in the case of high subcooling and may be divided into two types, regular and irregular complex flow oscillations. Under the same thermohydraulic conditions, the marginal stability boundary (MSB) of regular complex oscillations is similar to that of density wave oscillation without rolling motion. And the influences of rolling amplitude and rolling period on its MSB are slight.

Key words [rolling motion](#) [flow instability](#) [density wave oscillation](#) [complex flow oscillation](#) [natural circulation](#)

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