物理

ADS次临界反应堆的中子共轭方程

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摘要　　与临界反应堆相比，ADS次临界反应堆的外源中子和裂变中子的空间分布具有严重的不均匀性，对应的中子价值也不同。本工作对次临界反应堆的稳态输运方程作分群扩散近似，得到了多群方程，进一步推导出按堆芯功率归一化的中子共轭方程表达式和与功率相关的中子价值函数表达式，给出了次临界反应堆中子价值的物理意义。由稳态中子共轭方程组出发，给出了两种带外加中子源的次临界反应堆增殖因数的表达式。

关键词　　加速器驱动的次临界系统　次临界反应堆　中子共轭方程　增殖因数

分类号

扩展功能

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Adjoint Equation of ADS Sub-critical Reactor

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Abstract Compared with the critical reactor, the distributions of source neutron and fission neutron are asymmetric inside ADS (accelerator driven sub-critical system) sub-critical reactor, as well as the importance function is different. The multigroup-diffusion approximation was used to simplify the steady-state transport equation into multigroup equation. Then an adjoint equation normalized by the power of reactor core and an importance function associated with the relative power were derived. The physical significance of neutron importance in the sub-critical reactor was also derived. Finally, two different expressions of multiplication factor for sub-critical reactor with external neutron source were derived based on steady-state adjoint equations.

Key words accelerator   driven   sub-critical   system   sub-critical   reactor   adjoint   equation   multiplication   factor

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