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反应堆临界-燃耗耦合蒙特卡罗计算

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摘要 基于连续点截面MCNP程序 ,研制了三维多群P3 中子输运蒙特卡罗程序MCMG ,并与栅元均匀化程序WIMS耦合 ,实现了临界 燃耗耦合计算。采用WIMS产生的 69群共振、自屏宏观中子截面和BUGLE 80u47群微观中子截面 ,分别计算了简单反应堆和临界实验堆问题 ,计算结果与其它输运方法的计算结果和试验结果一致。在相同计算精度下 ,MCMG的计算时间较MCNP的计算时间少

关键词 三维多群P3 蒙特卡罗 临界燃耗耦合 临界实验堆

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The Coupled Calculation of Criticality and Burnup by Monte-Carlo Method

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Abstract Based on the continuous energy cross section Monte Carlo code MCNP a 3 D multigroup P 3 neutron transport Monte Carlo code MCMG is developed. The MCMG code is realized the coupled calculation of criticality and burnup with the lattice homogeneous code WIMS. It uses the 69 group resonance and self shield macroscopic neutron cross section which are produced by the WIMS code and BUGLE 80u47 group microscopic neutron cross section libraries to simulate the simple reactors and the critical test reactor. The calculation results are in good agreement with the results of other transport methods and experiments. The computational time of the MCMG code is less than that of MCNP code with the same precision.

Key words D multigroup P 3 Monte Carlo couple of criticality and burnup critical test reactor

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