

Inter-Assembly Thermal Flux Gradient Correction of Homogenization Parameters

Based on One-Dimensional Heterogeneous Interface Model

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Abstract

To remedy the deficiency of single assembly homogenization with zero current boundary condition, proposed is a new approach solving a simple few-region one-dimensional one-group model consisting of pin columns of two adjacent assemblies. The cross-sections representing homogenization. After solving analytically for the thermal flux across each interface of materials by the integral transport method, equivalence theory parameters or form factors are corrected during the nodal diffusion calculation to take into account the effect of the thermal flux gradient. The accuracy and the applicability of the proposed method were tested against a small benchmark problem consisting of MOX fuel and bare water reflector. The result shows that the method solving the one-dimensional model consisting of only six regions per interface can reduce significantly the errors in reconstructed pin powers near strong material interfaces. each pin column come from the single assembly