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**A Refinement of the Analytic Function Expansion Nodal Method
with Interface Flux Moments**

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Abstract

A refinement of the AFEN method has been performed by increasing the number of flux expansion terms in the manner that the original basis functions are combined with the transverse-direction linear functions. In this manner, the added terms can be kept to still satisfy the diffusion equation. The additional constraints required are provided by the interface flux moments defined as the weighted-average fluxes at the interface.

The refined AFEN method was tested against the OECD-L336 benchmark problem. The results show that the method improves the accuracy in predicting the flux distribution and that it can replace the corner-point fluxes with the interface moments without accuracy degradation. Excluding the corner-point flux increases the flexibility in implementing this method into the existing codes that do not have the corner-point flux scheme and may make it fit better for the non-linear scheme based on two-node problems.