Domain Decomposition and Load Balancing in the AMTRAN Neutron Transport Code

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Abstract: Effective spatial domain decomposition for discrete ordinate (Sn) neutron transport calculations has been critical for exploiting massively parallel architectures typified by the ASCI White computer at Lawrence Livermore National Laboratory. A combination of geometrical and computational constraints has posed a unique challenge as problems have been scaled up to several thousand processors. Carefully scripted decomposition and corresponding execution algorithms have been developed to handle a range of geometrical and hardware configurations.

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