

Pre-calculation of A-lite MCNP Reference Model for ITER Neutronics

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The A-lite is MCNP reference model for the neutronics calculation of ITER. This model has been developed by ITER Organization(IO), which was the result of collaboration in several institutions of the world. A-lite is 3D 40 degree sector, it includes the following components: in-vessel components(blanket, divertor, and dummy port plugs), vacuum vessel, coils, cryostat and bioshield. First wall and shield block have been homogenized in 2 groups with 5 layers. In the first wall, there are three layers of beryllium armor, CuCrZr heat sink, stainless steel layer, and in the shield block, there are S.S. layer, S.S layer with reduced density and blanket cooling manifold. the MCNP input files consists of about 24,000 lines, and recently IO have presented the 40 degree model with updated divertor and lower ports.

In this study, the pre-calculation was performed for the evaluation of neutron flux and heat load in the first wall, and shielding effect. For this calculation, we have modified the plasma source and tally of MCNP input file. And next step, we will modify the plasma source and neutron loading, so the wall load will be evaluated more precisely.

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