Aspect on equilibrium calculation of ITER configuration in Tokamaks

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Abstract

In this work, we have constructed an ITER configuration, which is generated by currents flowing within the plasma and currents flowing in external coils. The plasma current density takes the form $j_\varphi(r, z) = -ar - bR^2/r$ or other H-mode current profile inside the plasma, and is zero in the surrounding vacuum. We use Green's function method to compute the plasma current contribution, together with a homogeneous solution to the Grad-Shafranov equation, to construct the full solution. Matching with the constant boundary condition on the last closed flux surface is performed to determine the homogeneous solution. Then the total solution in the full space is obtained. We can also obtain the value of external coils current by the homogeneous solution.

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