

Modelling of magnetic field structure of the Ergodic Divertor of Tore Supra

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Analytical model to study the structure of magnetic field developed for the TEXTOR-DED[1] has been applied for the similar study of the Ergodic Divertor of Tore Supra [2] tokamak. We modelled the coil configuration of ED Tore Supra consisting of six modules equidistantly located along toroidal direction on the low-field-side of the torus with given toroidal and poloidal extensions. Asymptotical formulas for the perturbation magnetic field created by the ED coils are obtained and their poloidal and toroidal spectra are analyzed. The Hamiltonian formulation of field line equations in straight-field-line coordinates (Boozer coordinates) is used to study the magnetic field structure in the ED. The spectrum of magnetic perturbations in these coordinates are analyzed for the different plasma parameters. The computationally efficient mapping method [3] is applied to integrate the Hamiltonian field line equations. The structure of ergodic and laminar zones are studied by plotting Poincaré sections, so-called laminar plots (contour-plots of wall to wall connection lengths) and magnetic footprints.

References

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