

Modelling of RFX-mod2 tokamak equilibria with DEMO-like shape conditions and negative triangularity

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Abstract:

In this paper, DEMO-like shaped plasma equilibria are defined for RFX-mod2 tokamak operations by using the Inverse Equilibrium Tool (IET code). IET allows for the computation of the coil currents needed to obtain a predetermined plasma shape with well defined plasma global parameters (i.e. total plasma current and total poloidal magnetic flux at the boundary) by solving a constrained minimization problem. The new shape conditions would allow achieving higher plasma current and plasma density values at the same toroidal magnetic field and safety factor limits of previous RFX-mod tokamak operations. The feasibility of these new equilibria is explored in terms of coil current requirements and vertical stability analysis. This study shows that RFX-mod2 is a flexible device, able to perform DEMO-like shaped tokamak operations with low requirements on both magnitude and distribution of active coil currents.