

Plasma confinement in tokamaks with robust torus

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The non-twist standard map occurs frequently in many fields of science specially in modeling the dynamics of the magnetic field lines in tokamaks. Robust tori, dynamical barriers that impede the radial transport among different regions of the phase space, are introduced in the non-twist standard map in a conservative fashion. The resulting Non-Twist Standard Map with Robust Tori (NTRT) is an improved model to study transport barriers in plasmas confined in tokamaks. The robust torus prevents the magnetic field lines to reach the tokamak wall and reduces, in its vicinity, the destruction of islands and invariant curves due to the action of resonant perturbations. Our results indicate that the RT implementation would decrease the field line transport at the tokamak plasma edge.