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Study of symmetry breaking induced stochasticity in magnetic field surfaces with the 3D-Maptor code JULIO HERRERA-VELÁZQUEZ, Instituto de Ciencias Nucleares, Universidad Nacional Autónoma de México, ESTEBAN CHÁVEZ-ALARCÓN, Instituto Nacional de Investigaciones Nucleares —
To a certain extent, the success in designing a magnetic confinement device, rests in the capacity of producing a configuration, such that there is a symmetry which allows the existence of closed and sturdy magnetic field surfaces. If such symmetry is broken, either by instabilities in the plasma, or by engineering defects in the design and construction of the system, the surfaces break up, leading to the loss of confinement. A simple approach is to study this problem, is by using discrete area preserving maps, but at the cost of missing some of the physics issues. As an alternative, a 3-D code has been developed in order to simulate the magnetic field lines, starting from the currents involved. A simple way to break the symmetry is by including tilted coils either on the inboard or outboard sides. Using this approach, different configurations are studied in this work, leading to stochastization of the the magnetic field surfaces.

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