6th Asia-Pacific Conference on Plasma Physics, 9-14 Oct, 2021, Remote e-conference

Mapping models for magnetic configurations and simulation of magnetic islands in Tokamaks

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systems. For the field line tracing two

Magnetic field lines in plasmas can be regarded as trajectories of Hamiltonian methods can be applied: i) integration of the trajectory and ii) mapping of the trajectory. The latter is a modern technique for the Hamiltonian system. It

decades. A systematic Theory of these

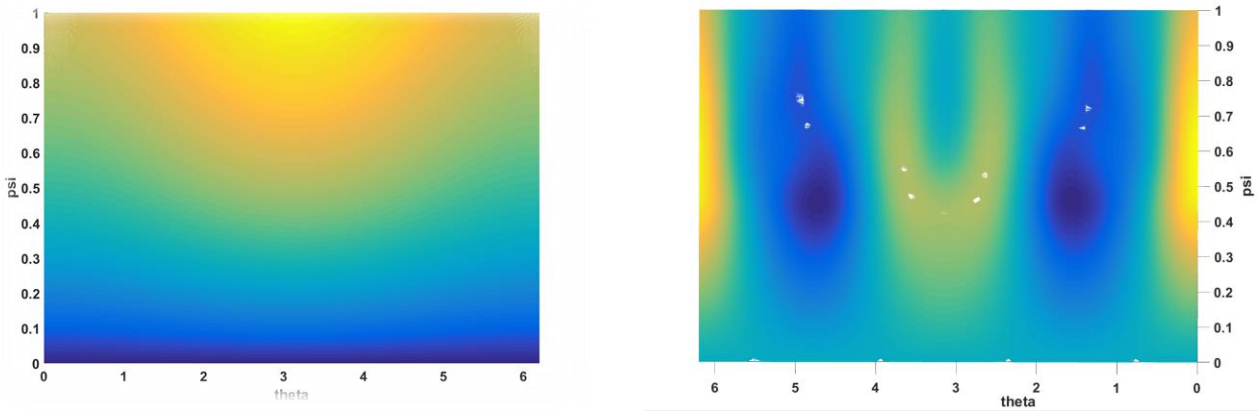
Regions[1,2]. Symplectic maps for many Hamiltonian problems have been extensively used during the last four maps with many illustrative Examples can be found in the recent book This paper is devoted to the study of some mapping models for the study of magnetic configurations in tokamaks which exhibit non-axisymmetric MHD or mapping procedure always conserves the main flux preserving property of the magnetic field, which is important for a correct reproduction of the longterm is more than an order of magnitude, faster than the integration. A properly chosen behavior of field lines in stochastic RMP perturbations.

The destruction of a transport barrier is described using the transmissivity between the chaotic zones situated of its both sides. Figure 1 shows a quiet behavior of the Tokamak plasma(a) and its turbulent behavior(b) in various modes. In fact, Section (b) also describes the overlap of magnetic islands.

References

[1] Constantinescu D, Dumbrajs O, Igochine V and Weyssow B. 2007 On the accuracy of some mapping techniques used to study the magnetic field dynamics in tokamaks. Nucl. Fusion **48** (2008) 024017 (9pp)

[2] Balescu R. 1988 Transport Processes in Plasmas (Amsterdam: Elsevier/North-Holland)



(a) (b)

Figure 1. (a) Tokamak Integrated Phase Map Model Here we have c chosen the most optimal step for the correct phase map. $\pi/4$. **(b).** Simulation of magnetic islet overlap in Tokamak plasma in modes (1 and 2), (2 and 5), (1 and 3) and (2 and 7).