

Abstract Submitted
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Numerical studies of nonlocal effects of the low mode numbers tearing modes and their mitigation in the DIII-D ALKESH PUNJABI, HALIMA ALI, Center for Fusion Research & Training, Hampton University, Hampton, VA 23668, TODD EVANS, General Atomics, San Diego, CA 92186 — In this work, the method of maps [1-4] is used to study the trajectories of magnetic field lines in the DIII-D tokamak. Data from the DIII-D shot 115467 is used to determine the parameters in the maps. Effects of the $m=1$, $n=\pm 1$ tearing modes and the dipole perturbation from the C-coils on the motion of field lines are calculated. Internal tearing modes produce non-local effects on the magnetic footprints, and destroy their symmetry. Dipole perturbations mitigate the effects of the tearing modes, spread the heat-flux on the plates over a wider area, reduce the peak heat-flux, and reorganize the phase space structure in a new pattern that has the same symmetry as that of the external perturbation. The low dimensionality of the system and its symplecticity impose severe restrictions on the motion of the system in phase space forcing it to take on the symmetry properties of the perturbations. This work is done under the DOE grant number DE-FG02-01ER54624. 1. A. Punjabi, A. Boozer, and A. Verma, *Phys. Rev. Lett.*, **69**, 3322 (1992). 2. H. Ali, A. Punjabi, and A. Boozer, *Phys. Plasmas* **11**, 4527 (2004). 3. A. Punjabi, H. Ali, and A. Boozer, *Phys. Plasmas* **10**, 3992 (2003). 4. A. Punjabi, H. Ali, and A. Boozer, *Phys. Plasmas* **4**, 337 (1997).

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