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Formation of Counter-Flows by Magnetic Perturbations in Computer Simulations of the Plasma Boundary of Tokamaks[1] H. FRERICHS, U. Wisconsin-Madison, O. SCHMITZ, U. of Wisconsin-Madison, T.E. EVANS, General Atomics, Y. FENG, MPI, D. REITER, FZJ — Simulations of the plasma boundary of an ITER similar shape H-mode plasma at DIII-D with the EMC3-EIRENE code have shown that a pattern of counter-flow channels emerges when resonant magnetic perturbations (RMPs) are applied. This pattern is found to be correlated with a flow-reversal in the perturbed scrape-off layer bounded by the perturbed separatrix. As a result of small non-axisymmetric perturbations to an axisymmetric equilibrium field, stable and unstable invariant manifolds associated with the separatrix split and intersect transversely. This so-called homoclinic tangle determines where field lines may connect from inside of the original separatrix to plasma facing components, and it introduces a checkerboard pattern of field lines with short and long connection lengths. In the present contribution we focus on the resulting plasma flows and we give a detailed analysis of the emerging flow pattern.

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