Transport barriers for monotonic and non-monotonic poloidal flows using maps[1] JULIO MARTINELL, NIKOLAY KRYUKOV, CAROLINA TAFOYA, National Autonomous University of Mexico — Test particle EXB transport due to an infinite spectrum of drift waves in two dimensions is studied using a Hamiltonian approach, which can be reduced to a 2D mapping. Finite Larmor radius (FLR) effects are included taking a gyroaverage. The presence of poloidal flows is included which gives rise to transport barrier formation. For large wave amplitudes there is a transition to chaos and the barriers are destroyed. FLR effects tend to restore the barrier, implying that fast particles are better confined. For a thermal FLR distribution, the PDF is non-Gaussian while the transport remains diffusive when there is no flow but becomes ballistic when the flow is strong enough. When the background flow varies linearly with radius, the map can be symplectic but for more general flows a two-step should be used. The stability of transport barriers is analyzed for several types of flow. This is displayed in fractal diagrams wave amplitude, FLR and flow strength.

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