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Transport suppression by shear reduction JULIO MARTINELL, ICN, UNAM, Mexico, DIEGO DEL-CASTILLO-NEGRETE, Oak Ridge National Laboratory — The relationship between transport and shear is a problem of considerable interest to magnetically confined plasmas. It is well known that there are cases in which an increase of flow shear can lead to a reduction of turbulent transport. However, this is not a generic result, and there are transport problems in which the opposite is the case. In particular, as originally discussed in Ref. [1], barriers to chaotic transport typically form in regions of vanishing shear. This property, which is generic to the so-called non-twist Hamiltonian systems [2], explains the observed resilience of transport barriers in non-monotonic zonal flows in plasmas and fluids and the robustness of shearless magnetic surfaces in reverse shear configurations. Here we study the role of finite Larmor radius (FLR) effects on the suppression of chaotic transport by shear reduction in a simplified model. Following Ref. [3] we consider a model consisting of a superposition of drift waves and a non-monotonic zonal flow. The FLR effects are incorporated by gyroaveraging the $\mathbf{E} \times \mathbf{B}$ velocity, and transport is studied by following the evolution of ensembles of test particles.

[1]del-Castillo-Negrete and Morrison, Phys. Fluids A **5**, 948 (1993)
[2]del-Castillo-Negrete, Greene, and Morrison, Physica D **91**, 1 (1996)
[3]del-Castillo-Negrete, Phys. Plasmas, **7**, 1702 (2000)

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