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Area preserving map models of gyro-averaged ExB chaotic transport[1] J. FONSECA, University of Sao Paulo, Brazil, D. DEL-CASTILLO-NEGRETE, Oak Ridge National Laboratory, USA — Area preserving maps have been extensively used to model 2-dimensional chaotic transport in plasmas. Here we focus on drift-wave maps describing chaotic transport in $\mathbf{E} \times \mathbf{B}$ zonal flows perturbed by electrostatic drift waves. Going beyond previous studies, we include finite Larmor radius (FLR) effects by gyro-averaging the corresponding Hamiltonian of the map. In the limit of zero Larmor radius, the gyro-averaged map reduces to the standard Chirikov map in the case of monotonic $\mathbf{E} \times \mathbf{B}$ shear flows, and to the standard non-twist map in the case of non-monotonic $\mathbf{E} \times \mathbf{B}$ shear flows. Like in the case of continuous $\mathbf{E} \times \mathbf{B}$ drift wave models,[2] we show that in the gyro-averaged maps, FLR effects lead to chaos suppression, bifurcation of the shearless curve, and a complex phase space topology. Dynamical systems methods are used to quantify the dependence on the Larmor radius of the threshold for the destruction of transport barriers, and the transport properties of an ensemble of test particles with a Maxwellian distribution

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[2]D. de-Castillo-Negrete and J.J. Martinell, Commun. Nonlinear. Sci. Numer. Sim. **17**, 2031 (2012); J.J. Martinell and D. de-Castillo-Negrete, Phys. of Plasmas **20**, 022303 (2013).

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