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Statistical properties of the gyro-averaged standard map JULIO D. DA FONSECA, University of Sao Paulo, Institute of Physics, Brazil, IGOR M. SOKOLOV, Humboldt University, Institute of Physics, Germany, DIEGO DEL-CASTILLO-NEGRETE, Oak Ridge National Laboratory, IBERE L. CALDAS, University of Sao Paulo, Institute of Physics, Brazil — A statistical study of the gyro-averaged standard map (GSM) is presented. The GSM is an area preserving map model proposed in [J. Fonseca, et al., Phys. of Plasmas **21**, 092310 (2014)] as a simplified description of finite Larmor radius (FLR) effects on ExB chaotic transport in magnetized plasmas with zonal flows perturbed by drift waves. The GSM's effective perturbation parameter, gamma, is proportional to the zero-order Bessel function of the particle's Larmor radius. In the limit of zero Larmor radius, the GSM reduces to the standard, Chirikov-Taylor map. We consider plasmas in thermal equilibrium and assume a Larmor radius' probability density function (pdf) resulting from a Maxwell-Boltzmann distribution. Since the particles have in general different Larmor radii, each orbit is computed using a different perturbation parameter, gamma. We present analytical and numerical computations of the pdf of gamma for a Maxwellian distribution. We also compute the pdf of global chaos, which gives the probability that a particle with a given Larmor radius exhibits global chaos, i.e. the probability that Kolmogorov-Arnold-Moser (KAM) transport barriers do not exist.

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