



Drift wave turbulence in a dense semiclassical magnetoplasma

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(Submitted on 7 Jul 2011)

A semiclassical nonlinear collisional drift wave model for dense magnetized plasmas is developed and solved numerically. The effects of fluid electron density fluctuations associated with quantum statistical pressure and quantum Bohm force are included, and their influences on the collisional drift wave instability and the resulting fully developed nanoscale drift wave turbulence are discussed. It is found that the quantum effects increase the growth rate of the collisional drift wave instability, and introduce a finite de Broglie length screening on the drift wave turbulent density perturbations. The relevance to nanoscale turbulence in nonuniform dense magnetoplasmas is discussed.

Comments: Submitted to Phys. Letters A (2011)
Subjects: **Plasma Physics (physics.plasm-ph)**
Journal reference: Physics Letters A, 375, 3138-3141 (2011)
DOI: [10.1016/j.physleta.2011.07.004](https://doi.org/10.1016/j.physleta.2011.07.004)
Cite as: **arXiv:1107.1308 [physics.plasm-ph]**
(or **arXiv:1107.1308v1 [physics.plasm-ph]** for this version)

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[v1] Thu, 7 Jul 2011 07:12:46 GMT (583kb)

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