

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Dispersion relations of parallel propagating electromagnetic waves in magnetized quantum electron plasmas with finite temperature
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KAIST — In the present paper, parallel propagating electromagnetic waves in magnetized quantum electron plasma are discussed. The dispersion relations are derived using the quantum Vlasov equation for the Fermi Dirac distribution with finite temperature. It is shown that inclusion of finite temperature increases the group and phase velocities for the upper L and R waves whereas it decreases the velocities in the case of lower R waves. We present the dispersion relations in analytic forms for the long wavelength limit in both the low and high degeneracy cases, and compare them with numerical solutions. We also discuss the effect of finite temperature and the quantum mechanical effect on the Landau damping.

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Date submitted: 19 Sep 2019

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