

## **Propagation of Electrostatic Drift Waves in Nonuniform and Nonideal Quantum Magnetoplasma**

**Ahmad Mehramiz\*, Babak Mohammadhosseini, Elham Shaban Soleimani**

Department of Physics, Faculty of Science, Imam Khomeini International University, Qazvin. Iran

Received: 30.03.2017    Final revised: 04.01.2018    Accepted: 27.01.2018

### **Abstract**

In this study, the propagation of the electrostatic drift waves is investigated in a non-uniform quantum plasma medium. The analytical expression for dispersion relation of the waves is derived by taking into account the resistivity and quantum aspects of the medium. It has been shown that the quantum effects, alter the dispersion relation of the drift modes. The result is the appearance of modified electron diamagnetic drift waves as well as ion acoustic waves. Furthermore, the velocities of these waves are greater than their classical case. The graphical analysis also revealed that the quantum corrections cause electron branch of the drift waves to become propagative. In the presence of resistivity, the electron drift wave is always unstable, whereas the ion branch of the drift wave becomes damped. On the other hand, in the absence of quantum aspects and given zero resistivity, the two generated ion acoustic and electron drift waves are completely stable.

**Keywords:** Drift waves, Inhomogeneous plasma, Quantum plasma

---

\* Corresponding Author: mehramiz@sci.ikiu.ac.ir