

Excitation of Lower Hybrid Waves in Streaming Dusty Plasma

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Abstract—*The linear theory of excitation of electrostatic lower hybrid waves by streaming electrons is presented. The dispersion relation for the lower hybrid mode is obtained for a warm plasma containing electrons, ions and negatively charged dust grains. The frequency of the lower hybrid mode increases with the relative density of negatively charged dust grains. It is found that the instability has the largest growth rate when the velocity of electron beam in the direction of the magnetic field is comparable to the parallel phase velocity of the mode. An increase in the dust population enhances the growth rate of the lower hybrid wave instability through the effect of capturing electrons. However, the maximum growth rate decreases with an increase in the velocity of the streaming electrons travelling parallel to the magnetic field.*

Keywords: *Lower hybrid, frequency, dispersion, growth rate.*