

Wave-particle interactions in the Earth's magnetosphere

Abstract: In this work we analyse wave-particle interactions in the Earth's magnetosphere. After the theoretical introduction we find the dispersion relation of plasma described by parameters obtained from the particle analyser PEACE aboard Cluster spacecraft and we identify possible wave modes. The dispersion relation is derived using software WHAMP, which uses numerical approach and works with hot plasma theory. Various directions of wave propagation are analysed in order to find instabilities. We look at how maximal found instability changes while varying plasma parameters and we try to find plasma parameters leading to higher instabilities. Using numerical integration we try to verify dependency of instabilities on different plasma components and its parameters, especially on loss cone.