

This work deals with the linear analysis of plasma waves, especially with the methods of solution of a hot plasma dispersion relation.

There are cited some results achieved in the space plasma research and mapped current numerical methods of their analysis.

Besides, this work introduces a new numeric procedure, computer code PDRS (Plasma Dispersion Relation Solver), which allows finding solution of a dispersion function of a cold or hot plasma with general distribution function.

It also demonstrates the usage of the PDRS methods on real examples of waves in space plasma based on the spacecraft Cluster measurement.