Diffraction of Electromagnetic Waves in Dusty Magnetoplasma
ANDREY YATSENKO, NIKOLAY GOROBETS, Karazin Kharkiv National University — It is known, that the plasma in an external magnetic field (magnetoplasma) becomes anisotropy. For example, the Earth ionosphere has such properties. It's possible to present the interaction of electromagnetic waves with dusty magnetoplasma as a diffraction of electromagnetic waves on the macroscopic particles located in the anisotropic plasma. This problem solved by a method of the integral equations of macroscopic electrodynamics, constructed on the basis of Green's function for anisotropic magnetoplasma. According to this method, the boundary problem of electrodynamics is represented as internal and external problems. At the first stage the internal problem is solved. The field exciting in every macroscopic particle by an external source of electromagnetic energy is defined. At the second stage the external problem is solved, the complete electromagnetic field is defined which is a sum of an external field and scattering field. The diffraction of electromagnetic waves on linear structures in magnetoplasma is also considered on the basis of the received integral equations. The features of waves dispersion in different frequency ranges, the conditions of a resonance are determined. The dispersal equations are received which establish the accordance between parameters of linear structure and plasma at a resonance. The scattering electromagnetic fields are determined.

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