

THE INFLUENCE OF THE LOSS ON THE SIGNAL-FORM IN THE INTERPLANETARY/EARTH'S ATMOSPHERE

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One of the most frequently investigated questions is the propagation of electromagnetic signals in different media containing loss. The space and interplanetary investigations of wave propagation and the electromagnetic monitoring of the Earth's environment also often claim a detailed, accurate description of the influence of loss on the propagating electromagnetic signal. In this paper a new, accurate full-wave solution is presented in which the presence of loss in different media (e.g. isotropic or anisotropic, magnetized electron-plasma) is taken into consideration by collision of particles, and the influence of this effect can be followed fully analytically along the propagation path. The investigated signals are excited by real impulses; the applied solving method is based on the Method of Inhomogeneous Basic Modes (MIBM). As a new result, it is verified by the new solving method, that a part of the signal energy can penetrate into the medium as a left hand rotating mode, only and exclusively because of the presence of loss. The paper shows the mathematical solution and some numerical results for different plasma models.

UWB, full wave

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