

Stability of magnetostatic surface waves in a Semiconductor-Ferrite-Left-Handed Material waveguide Structure

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Abstract

A great deal of important development has been made in the studies of magnetic and magneto static solitons in gyro-magnetic materials. This was stimulated by the great achievement in the theoretical research and practical application of optical solitons in fibers. Recently increasing works have been devoted to study and fabricate new artificial materials called metamaterials or left handed materials. These materials have unusual behavior as they have simultaneously both negative permittivity and permeability.

In this paper, we investigate the effect of left handed materials and the conductivity of semiconductor material on the dispersion characteristics of left-handed-ferrite-semiconductor waveguide structure, and then we discuss the stability of magnetostatic surface waves in the mentioned three waveguide structures by perturbation method.

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