Abstracts

Electrodynamics Theory of Finite Magnetostatic Waveguides

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In this paper the electrodynamic theory of arbitrary magnetostatic waveguide structure (WS) based on a sequence approach method is established. To calculate a wave number, a magnetic scalar potential distribution, an electric field and a power frequency dependence of arbitrary type WS's eigenmodes a new version of finite difference method based on integro-interpolated approach is developed. To show the availability of this technique four types of the MSW WS are studied: the first is a narrow waveguide being analyzed taking into account the two-dimensional inhomogeneity of its internal demagnetized field which follows from the rigorous solution of respective nonlinear boundary task to calculate the dc magnetic field distribution in the ferrite slab of finite sizes. The second and third WS are the two ferrite slabs of a finite width connected guides and the last is the finite width double-layer of different saturation magnetization nonreciprocal WS. The results of the computing method validity verification are discussed in the paper too. It concludes the developed method to be powerful and to be used to analyze electrodynamics properties of MSW WS's of different types.

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