

## On Transferring of Transient Signals along Hollow Waveguide

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**Abstract :** In Electromagnetics, there are three canonical boundary value problem with given initial conditions for the electromagnetic field sought, namely: Cavity Problem, Waveguide Problem, and External Problem. The Cavity Problem and Waveguide Problem were rigorously studied and new results were arised at original works in the past decades. In based on studies of an analytical time domain method Evolutionary Approach to Electromagnetics (EAE), electromagnetic field strength vectors produced by a time dependent source function are sought. The fields are took place in L2 Hilbert space. The source function that performs signal transferring, energy and surplus of energy has been demonstrated with all clarity. Depth of the method and ease of applications are emerged needs of gathering obtained results. Main discussion is about perfect electric conductor and hollow waveguide. Even if well studied time-domain modes problems are mentioned, specifically, the modes which have a hollow (i.e., medium-free) cross-section domain are considered.

**Keywords :** evolutionary approach to electromagnetics, time-domain waveguide mode, Neumann problem, Dirichlet boundary value problem, Klein-Gordon

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