Abstract

Electrodynamics of Metallic Photonic Crystals and Problem of Left-Handed Materials

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An exact analytical theory of the electromagnetic waves in metallic photonic crystals with a small volume fraction of a metal is presented. It is shown that there are waves with a very low cutoff frequency ω_0 and that the permittivity ϵ is negative below ω_0. We show that if the crystal is embedded into a medium with negative μ, it has no propagating modes at any frequency. Thus, such a compound system is not a left handed material (LHM). The recent experimental results on the LHM are discussed.

[¶]Presenter