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Title

Propagation properties of broadband terahertz pulses through a bounded magnetized thermal plasma

Abstract

An analysis of THz waves propagation in dense, collisional, thermal, magnetized and bounded plasma is presented. By introducing the dielectric constant of a warm magnetoplasma and using the method of impedance transformation with multiple dielectrics, the coefficients of power reflection (R) and absorption (A) are derived for a bounded plasma model by a lossless plate and a conductor plate. The effects of electron temperature, collision frequency, external magnetic field, electron density and thickness of the plasma slab on the absorption coefficient are analyzed numerically. It is found that these plasma parameters can cause significant change in the value of A. Some phenomena, for example negative power absorption, upper-hybrid resonance absorption and geometric resonances absorption, are observed and the behavior of the THz wave propagation inside the plasma model is explained numerically and physically. (31 References).