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Title:The propagation character of black body radiation in a uniform plasma layer
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Abstract:A modified radiation source model is built up to study the interaction between electromagnetic waves and partially ionized uniform plasma layer, by considering the incident power spectrum profile and introducing a perfect black body. The effect of black body radiation temperature, electron number density, and collision frequency on the relative power absorption and transmission spectra of black body terahertz radiation is studied under atmosphere condition. The relative transmission spectrum on the plasma-air interface is calculated and agrees with measured results under the experiment condition. The black body radiation character spectrum with different radiation temperature can be decreased and modified by a dense plasma layer, especially by increasing the electron number density and the collision frequency, being favourable to the plasma cloaking and the far-infrared countermeasure in terahertz frequency range. © 2012 Elsevier Ltd. All rights reserved.
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