

Taming the Blackbody

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Since the first experimental demonstration of negative index, research into metamaterials has grown enormously. The ability of metamaterial to achieve nearly any electromagnetic response in nearly any frequency band suggest many exotic applications including invisible cloaks and perfect lenses. One recent field of research is that of metamaterial perfect absorbers (MPAs) due to their unique ability to achieve unity absorption with high efficiency. Here we experimentally demonstrate terahertz, infrared, and optical metamaterials able to control the absorption and emission of electromagnetic waves over a broad bandwidth. A metamaterial absorber which controls the emissivity spectrum of a body at a particular temperature over a bandwidth of 50% is demonstrated which may be applied as a coating to materials to control their blackbody emission spectra.

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