Thermal Emission by Photonic Micro-textured Surfaces

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Ordinary metallic photonic crystals (PCS) have photonic band gaps in which the density of states is suppressed. Thermal emission of photons is suppressed in those frequencies, and is enhanced in other frequencies. We considered the thermal emission property of a photonic crystal and compared it with that of a simple micro-textured surface. The proposed micro-textured surface exhibits a similar optical thermal emission spectrum with that of a photonic crystal. In addition, the present proposed topology also suppress emission in low frequencies. This simple and yet effective surface structure inspires new directions in fabricating thermal emitting materials.