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Dielectric constant enhancement by aligned carbon nanotubes in composites JAKUB RYBCZYNSKI, YANG WANG, Boston College, Dept. of Physics, MA, BRIAN KIMBALL, J.B. CARLSON, Natick Soldier Center, MA, KRZYSZTOF KEMPA, ZHIFENG REN, Boston College, Dept. of Physics, MA — We study dielectric properties of composites made of isolated, aligned metallic carbon nanotubes, uniformly distributed in a dielectric matrix. We focus on the radio-microwave frequency range. We find, that properties of these composites depend crucially on the separation, aspect ratio and orientation of the nanotubes. In general, we show that carbon nanotubes can be used to produce composites with large real part of the dielectric function and a moderate loss, at loading low enough to allow the composite to remain mechanically flexible. A detailed study of morphology, nano-structure, and dielectric properties of such composites will be presented.

Krzysztof Kempa
Boston College, Dept. of Physics, MA

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