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84112. *New bounds for multiphase conducting composites.*

New bounds for effective properties tensors of multimaterial composites are suggested. The bounds depend on the isotropic conductivities of the mixed materials and their volume fractions. These bounds replace the Hashin-Shtrikman and translation bounds in the region of parameters where the last one is loose. We work out an example of three-materials composite of minimal conductivity when one of the phases is a superconductor. In this case, we show that the bounds are exact and determine optimal microstructures. (Received August 15, 2006)