Abstract Submitted
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Experimental and computational studies of finite-size effects in nanocomposites M.P. ROMAN, Dept. of Physics, NC State University, Raleigh, NC 27695, E.W. SKAU, D.R. STEVENS, L.N. DOWNEN, T.J. HOFFMAN, L.I. CLARKE — Polymeric nanocomposites are formed when a nanometer-sized particle is embedded within a supporting matrix. Such composites can also be nanostructured - that is, shaped so that characteristic sample length scales may be similar to at least one dimension of the embedded particle [1]. This is particularly true for long aspect-ratio particles such as nanotubes where the length of the particle can approach or exceed the thickness of a thin nanocomposite film or a nanofiber diameter. In these cases, the formation of a particle network (for instance, for mechanical or electrical conductivity enhancement) is affected. We present experimental electrical conductivity and 3-D continuum Monte-Carlo simulation results on such finite-sized percolation effects, which can occur whenever any dimension of the sample is less than ca. 10 times the longest dimension of the particle.

[1] D. R. Stevens, L. N. Downen, and L. I. Clarke, *Phys. Rev. B* **78**, 235425 (2008).

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