

Abstract Submitted
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Theory of dielectric properties of composites based on metallic nano-particles: Kohns Theorem approach. KRZYSZTOF KEMPA, Boston College — A long-wavelength electromagnetic radiation excites only the center of mass motion of electrons confined by a parabolic potential. We show, that this Kohn's Theorem applies to the case of metallic nano-particles embedded in a dielectric matrix, since each such particle can be viewed as an electron reservoir, with essentially parabolic confinement. A simple formula for the dielectric function can be derived this way, and it emphasizes the importance of the nano-particle geometry. In particular, we show that elongated, needle-like nano-particles, affect the dielectric function of the composite much stronger than the spherical nano-particles. Of importance is also the composite morphology. Predictions of this theory, generally in excellent agreement with experiment, will be presented.

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