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A plasmon absorption model for a super-lattice of single-walled carbon nanotubes M. E. MARKES, University of Nebraska-Kearney, P. F. WILLIAMS, University of Nebraska-Lincoln — Several years ago one of us (P. F. Williams*) developed a self-consistent dielectric response model for one-dimensional metals at high frequency using a tight-binding approximation. At the time this model was found useful in a study of the single-particle excitations and plasmon dispersion curves of tetrathiofulvalene-tetracyano-quinodimethane (TTF-TCNQ). This paper is a report of work in progress to extend this model to arrays of single-walled carbon nanotubes. First the quasi one-dimensional model is extended to represent free electrons confined to the surfaces of cylindrical shells arranged in a 2-D square array. The collective electronic excitations of this system are characterized by a frequency and wavelength dependent complex dielectric constant obtained using the method of self-consistent fields in the random phase approximation. Progress in extending the model to arrays of shells with surface structure will also be discussed.
*P. F. Williams and A. N. Bloch, Phys. Rev. B, **10,** 1097 (1974)

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