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**Electromagnetic energy transport through metallic nanoparticle arrays** STAVROULA FOTEINOPOULOU, Laboratoire de Physique du Solide, Facultes Universitaires Notre-Dame de la paix, B-5000 Namur, Belgium, JEAN-POL VIGNERON, Laboratoire de Physique du Solide, Facultes Universitaires Notre-Dame de la paix, B-5000 Namur, Belgium — We investigate electromagnetic (EM) energy transport through arrays consisting of Au spheres, 50 nm in diameter, with the Finite Difference Time Domain (FDTD) method. We assume the Drude model for the dielectric response of the Au nanospheres. The Drude model is incorporated into the FDTD technique with the introduction of an appropriate time-dependent polarization current. This method is known as Auxillary Differential Equation (ADE) method [1]. In order to test the validity of our numerical findings, we first focus on the EM excitations on a single metallic nanoparticle [2]. We compare for the latter case the FDTD results with analytical calculations following Mie theory. Over all we found reasonably good agreement between the two. Our numerical results indicate EM energy transport through the Au nanochain. Nonetheless, a careful analysis of the field profiles suggests that nearest-neighbor tight-binding like models fail to describe certain aspects of the observed EM energy transport through the nanochain. [1] "Computational Electrodynamics" A. Taflove, S. C. Hagness, Artech House, Boston (2000). [2] "Electromagnetic excitations on a single metallic nanoparticle", S. Foteinopoulou, J. P. Vigneron and C. Vandenbem, unpublished.

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