Self-energy corrections to anisotropic Fermi surfaces RAFAEL ROLDAN, M. PILAR LOPEZ-SANCHO, FRANCISCO GUINEA, Instituto de Ciencia de Materiales de Madrid, SHAN-WEN TSAI, University of California Riverside — The electron-electron interactions affect the low-energy excitations of an electronic system and induce deformations of the Fermi surface. These effects are especially important in anisotropic materials with strong correlations, such as copper oxides superconductors or ruthenates. In this talk I will analyze the deformations produced by electronic correlations in the Fermi surface of anisotropic two-dimensional systems, treating the regular and singular regions of the Fermi surface on the same footing. Simple analytical expressions are obtained for the corrections, based on local features of the Fermi surface, as the Fermi velocity and curvature. It will be shown that, even for weak local interactions, the behavior of the self-energy is non trivial, showing a momentum dependence and a self-consistent interplay with the Fermi surface topology. Applications of the method to cuprates- and Sr_2RuO_4-like Fermi surfaces will be shown. R. Roldan, M.P. Lopez-Sancho, F. Guinea and S.-W. Tsai; cond-mat/0603673

Rafael Roldan
Instituto de Ciencia de Materiales de Madrid