Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Electronic transport across linear defects in graphene ANA L C PEREIRA, CARLOS J PAEZ, State University of Campinas, JOO NUNO B RODRIGUES, National University of Singapore, NUNO M R PERES, Universidade do Minho - Portugal — Graphene is being proposed for a variety of new electronic devices. However, the required high-quality electrical properties are affected by the formation of polycrystalline structures, which are practically unavoidable by the growth methods known so far. As such, the scattering problem of an electron off a grain boundary becomes relevant. We investigate the low-energy electronic transport across grain boundaries in graphene ribbons and in?nite ?akes. Using the recursive Greens-function method, we compute the electronic transmittance across different types of grain boundaries in graphene ribbons and ?akes. We use the charge and current density spatial distributions to enhance our understanding of their electronic transport properties, and ?nd that electronic transport depends both on the grain boundaries microscopic details and on their orientation. We consider extended linear defects of type 585 and 5757, and also a spatial region where the grain boundary is composed by the superposition of two monolayer domains. In addition, we employ the transfer-matrix formalism to analytically study the electronic transport across a class of zigzag grain boundaries with periodicity 3. We ?nd that these grain boundaries give rise to intervalley scattering.

Ana L C Pereira
State University of Campinas

Date submitted: 06 Nov 2015 Electronic form version 1.4