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Chiral tunnelling of Dirac electrons in strained graphene A. GARCIA-SARAVIA, G. CORDOURIER-MARURI, M.E. CIFUENTES-QUINTAL, E. MARTINEZ-GUERRA, R. DE COSS, Departamento de Fisica Aplicada, CINVESTAV-Mérida, A. P. 73 Cordemex, Merida, Yucatan, Mexico — The behavior of the electrons in graphene is like massless Dirac fermions, which is a consequence of the characteristic energy spectrum of this material (E∼k). Perfect chiral tunnelling is expected when Dirac electrons pass through a step barrier (Klein paradox). However, in a two-dimensional system like graphene, the perfect tunneling is obtained only in a small range of incident angles. In the present work, we have studied the uniaxial deformation as a method of tunning the electronic transmittance in graphene. The effect of the armchair and zigzag strain on graphene was studied by means of first principles calculations, using the Density Functional Theory. For the calculations we used the pseudopotential-LCAO method. We found that the uniaxial deformations, induce an ellipsoidal distortion of the Dirac cones and isotropy breaking of the Fermi velocity. Finally, we used the Dirac–like equation to find the electronic transmittance as a function of the incident angle. We obtain that the strain induces a strong changes in the transmittance when the deformation is perpendicular to the incident axis.

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