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Transport properties of semi-Dirac PIERRE ADROGUER, Laboratoire de physique, ENS de Lyon — Recent theoretical works show the existence of a new type of dispersion relation in both VO_2/TiO_2 nanostructures[1] and in stressed graphene [2], where the electrons confined in a plane show a non-relativistic behavior along one direction, and relativistic in the other. This semi-Dirac dispersion $E = \sqrt{(v_F p_x)^2 + (p_y^2/2m)^2}$ can be observed in graphene when the Dirac cones of different valleys touch each other because of stress. When stress is increased, a gap is opened, and the graphene turns from a semi-metal to an insulator. We propose to adress this topological phase transition through transport measurements.

[1]V. Pardo and W.E. Pickett, Phys.Rev. Let. 102, 166803 (2009)
[2]G. Montambaux *et al.*, PRB 80, 153412 (2009)

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