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Scattering by periodic defect lines in graphene[1] J.N.B. RODRIGUES, Universidade do Porto, N.M.R. PERES, Universidade do Minho, J.M.B. LOPES DOS SANTOS, Universidade do Porto — Recently, Tsen et al. [1] demonstrated how one can probe the electric properties of a single grain boundary in graphene. Following this remarkable possibility, we study, from a theoretical point of view, the electronic transport across periodic defect lines in graphene. In the continuum low-energy limit, such defects act as infinitesimally thin stripes separating two regions where the Dirac Hamiltonian governs the low-energy phenomena. The behaviour of these systems is determined by the boundary condition imposed by the defect on the massless Dirac fermions. We demonstrate how this low-energy boundary condition can be computed from the tight-binding model of the defect line. We illustrate this procedure by considering a simple zigzag oriented defect line solely composed by pentagons: the *pentagon-only* defect line. The recently observed $zz(558)$ defect line [2], as well as the $zz(5757)$ defect line will also be considered [3].

[1] A. W. Tsen et al., Science 336, 1143 (2012).
[2] J. Lahiri et al., Nature Nanotechnology 5, 326 (2010).
[3] J. N. B. Rodrigues et al., arXiv:1208.0822 (2012).

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