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Enhanced Optical Dichroism of Graphene Nanoribbons[1] VITOR M. PEREIRA, F. HIPOLITO, Graphene Research Centre and Department of Physics, National University of Singapore, A.J. CHAVES, R.M. RIBEIRO, M.I. VASILEVSKIY, N.M.R. PERES, Department of Physics and Centre of Physics, University of Minho, Portugal. — The optical conductivity of graphene nanoribbons is analytical and exactly derived. It is shown that the absence of translational invariance along the transverse direction allows considerable intra-band absorption in a narrow frequency window that varies with the ribbon width, and lies in the THz band for ribbons 10-100nm wide. In this region the anisotropy in the optical conductivity can be as high as two orders of magnitude, which renders the medium dichroic, and allows near 100% polarizability with just a single layer of graphene. The interplay between the geometrically induced anisotropy with the anisotropy induced by plasmon absorption is also considered and discussed.

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Vitor Pereira
vpereira@nus.edu.sg
National University of Singapore

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