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Optical Selection Rule from Inversion Symmetry Breaking and Valley Optoelectronics in Graphene WANG YAO, DI XIAO, QIAN NIU, The University of Texas at Austin — Inversion symmetry breaking allows contrasted circular dichroism in different k-space regions, which takes the extreme form of optical selection rules for interband transitions at high symmetry points. In graphene systems with broken inversion symmetry, this enables valley dependent interplay of electrons with light of different circular polarizations, in analogy to spin dependent optical activities in semiconductors. We discuss graphene based valley optoelectronics applications where light polarization information can be interconverted with electronic information.

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