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Optical study of nonuniform quantum-Hall ferromagnetic states in bilayer and trilayer graphene MANUEL BARRETTE, RENÉ CÔTÉ, Universite de Sherbrooke — The chiral two-dimensional electron gas in the $N = 0$ Landau level of a Bernal-stacked bilayer graphene is host to a variety of broken-symmetry ground states that can be described as layer, spin, or orbital quantum Hall ferromagnets (QHFs). At filling factors $\nu = 1, 3$, an externally applied electric field between the two layers can induce a transition from uniform to nonuniform orbital QHF states with an helical or skyrmionic texture of electric dipoles [1]. A similar skyrmionic texture can also arise in the $N = 0$ Landau level of an ABC-stacked trilayer graphene. In this talk, we discuss the optical properties of these textured ground states. We compute their electromagnetic absorption as well as the Kerr and Faraday rotations induced by their collective excitations and show that each textured phase has a distinct optical signature.

[1] R. Côté, J. P. Fouquet, and Wenchen Luo, Phys. Rev. B **84**, 235301 (2011).

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