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Electromagnetic absorption in the quantum Hall ferromagnetic states of bilayer graphene RENÉ CÔTÉ, JULES LAMBERT, U. Sherbrooke, YAFIS BARLAS, U. Florida and NHMFL, ALLAN H. MACDONALD, U. Texas at Austin — In a quantizing magnetic field, the Landau level orbitals $n = 0$ and $n = 1$ of a graphene bilayer in the Bernal stacking have zero kinetic energy. An electron in the $N = 0$ Landau level must then be described by three quantum numbers: its spin, its valley index K or K' and an orbital quantum number $n = 0, 1$. It was recently shown [1] that, in the Hartree- Fockapproximation, the ground states of the graphene bilayer at integer filling factors $\nu \in [-3, 4]$ can be described as different kinds of quantum Hall ferromagnets (QHF's) with finite interlayer or inter-orbital coherence. In this talk, we discuss the new ground states introduced by adding a finite interlayer voltage, Δ_B to the bilayer. We study the dispersion relation of the pseudospin waves in these phases and compute the electromagnetic absorption due to these collective modes. We show that the different ground states give rise to different signatures in the absorption spectrum.

[1] Yafis Barlas, R. Côté, K. Nomura, and A. H. MacDonald, Phys. Rev. Lett.,**101**, 097601 (2008).

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