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Activation Energies and Dissipation in Biased Quantum Hall Bilayer Systems at Total Filling Factor $\nu = 1$. BAHMAN ROOSTAEI, University of Oklahoma, H.A. FERTIG, Indiana University and Technion, Israel, K.J. MULLEN, University of Oklahoma, STEVEN SIMON, Lucent Technologies, Bell Labs, NJ — Electrons in a closely spaced bilayer semiconductor structure, such as a double quantum well, are thought to form an interlayer coherent state when a perpendicular magnetic field is applied such that the total Landau level filling factor ν is 1. When the Zeeman energy is sufficiently large to polarize electron spins, the low energy excitations are thought to be topological pseudospin meron-antimeron pairs[1]. These objects carry charge $\pm e/2$,vorticity, and electric dipole moments perpendicular to the layers. Disorder is likely to unbind merons from antimerons and allow them to diffuse through the system independently[2]. Due to their different dipole moments, the various types of merons and antimerons may then in principle be distinguished in transport activation energies by an interlayer bias potential. We report on estimates of these energy differences in various circumstances, and discuss the connection of our results with recent experiments[3].
[1]K.Moon,et. al., PRB **51**,5138(1995).
[2]H.A.Fertig,G.Murthy, PRL **95**,156802(2005).
[3]R.D.Wiersma,et.al., PRL **93**,266805(2004).

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