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Spin-pseudospin textures in a strongly correlated bilayer quantum Hall system near $\nu = 1$ RENE COTE, JEROME BOURASSA, Universite de Sherbrooke, BAHMAN ROOSTAEI, University of Oklahoma, HERB A. FERTIG, University of Indiana, KIERAN MULLEN, University of Oklahoma — Recent experiments on strongly correlated bilayer quantum Hall systems [1,2] strongly suggest that contrary to the usual assumption, the electron spin degree of freedom is not completely frozen either in the quantum Hall or the compressibles states that occur near filling factor $\nu = 1$. These experiments imply that the quasiparticles near $\nu = 1$ could have both spin and pseudospin textures i.e. they could be CP3 skyrmions. Assuming that these skyrmions crystallize at very low temperature, we use a microscopic unrestricted Hartree-Fock calculation to compute the energy of these excitations as well as the number of flipped spins and pseudospins for various values of the separation between the well and of potential biais. We compare our results to previous calculations based on a field-theoretical description and discuss their relevance for the experiments of Refs. [1,2].
(1) I. B. Spielman, L. A. Tracy, J. P. Eisenstein, L. N. Pfeiffer, and K. W. West, Phys. Rev. Lett. 94, 76803 (2005).
(2) N. Kumada, K. Muraki, K. Hashimoto, and Y. Hirayama, Phys. Rev. Lett. 94, 96802 (2005).

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