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Charge density wave with meronlike spin texture induced by a lateral superlattice in a two-dimensional electron gas RENE COTE, XAVIER BAZIER-MATTE, Univ of Sherbrooke — The combined effect of a lateral square superlattice potential and the Coulomb interaction on the ground state of a two-dimensional electron gas in a perpendicular magnetic field is studied for different rational values of Γ, the inverse of the number of flux quanta per unit cell of the external potential, at filling factor $\nu = 1$ in Landau level $N = 0$. When Landau level mixing and disorder effects are neglected, increasing the strength W_0 of the potential induces a transition, at a critical strength $W_0^{(c)}$, from a uniform and fully spin polarized state to a two-dimensional charge density wave (CDW) with a meronlike spin texture at each maximum and minimum of the CDW. The collective excitations of this "vortex-CDW" are similar to those of the Skyrme crystal that is expected to be the ground state *near* filling factor $\nu = 1$. In particular, a broken U(1) symmetry in the vortex-CDW results in an extra gapless phase mode that could provide a fast channel for the relaxation of nuclear spins. The average spin polarization S_z changes in a continuous or discontinuous manner as W_0 is increased depending on whether $\Gamma \in [1/2, 1]$ or $\Gamma \in [0, 1/2]$.

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