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Coulomb frustrated phase separation in bilayer electronic systems

REZA JAMEI, STEVEN KIVELSON, Stanford University, BORIS SPIVAK, University of Washington — We have previously proven that in clean two dimensional electronic systems, long range Coulomb interactions convert what might otherwise have been a first order transition between a high density liquid and a low density insulating electron crystalline phase into a sequence of continuous phase transitions between various sorts of intermediate “electronic microemulsion phases.” Here, we consider the electronic micromemulsion phases in a bilayer system, with Coulomb interactions both within and between the layers. At mean-field level, we find infinite families of modulated phases, with a subtle interplay of the period and magnitude of the density oscillations in the two layers.

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