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Phase Diagram for Quantum Hall States in Graphene JIANHUI WANG, ANDREW IYENGAR, HERB FERTIG, Indiana University, LUIS BREY, CSIC-Madrid — We investigate integral and half-integral fillings (uniform and unidimensional stripe states respectively) for graphene using the Hartree-Fock approximation in the continuum limit. For fixed filling factor, the ratio between the scales of the Coulomb interaction and Landau level spacing $g = (e^2/\epsilon\ell)/(\hbar v_F/\ell)$ is a field independent constant. However, when B decreases, the number of filled negative Landau levels increases, which surprisingly turns out to *decrease* the amount of Landau level mixing. The resulting states at fixed filling factor ν (for ν not too big) has very little Landau level mixing even at arbitrary weak magnetic fields. This means many different phases should emanate from the origin of the phase diagram when plotted in the B v.s. density plane, in contrast to regular 2 dimensional electron gas which has a Wigner crystal state in the vicinity of the same point. The stripe amplitudes scale roughly as B, so that the density waves "evaporate" continuously as $B \to 0$. These results will be compared to those of tight binding calculations.

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