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**Quantum Hall liquid to Charge density wave phase transitions in ABC-trilayer graphene** YAFIS BARLAS, University of California at Riverside , RENE COTE, MAXINE RONDEAU, University of Sherbrooke, Quebec, Canada — We study interaction driven states within ABC-stacked trilayer graphene's 12-fold degenerate Landau level which appear near the neutral system Fermi level. The 12-fold degeneracy of the zero-energy LL is due to spin and valley degeneracy along with a degenerate set of triplet ( $n = 0, 1, 2$ ) LL orbitals. We predict that at filling factors  $\nu = -5, -2, 1, 4$  a quantum phase transition from a quantum Hall liquid state to a triangular charge density wave occurs as a function of the single-particle induced LL orbital splitting. This transition is preceded by a softening of the magneto-roton minima of the quantum Hall liquid which appears at  $ql_B \sim 2.4$ . The charge density wave is a manifestation of the LL orbital pseudospin textures with nonzero winding numbers. The phase diagrams at other filling factors along with the experimental consequences of our theoretical predictions will also be addressed.

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