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Topological phases in a multi-band 2D electron gas. PETR STEPANOV, YAFIS BARLAS, CHUN NING LAU, Univ of California - Riverside, DMITRY SMIRNOV, National High Magnetic FIeld Laboratory, KENJI WATANABE, TAKASHI TANIGUCHI, National Institute for Material Science, Japan, MAXIM KHARITONOV, University of Wurzburg, Germany, FAN ZHANG, UT Dallas, ALLAN MACDONALD, UT Austin — Recent experiments have established the phase diagrams of mono-, bilayer and ABC-stacked trilayer graphene at the charge neutrality, but that in more complex cases of graphene multiband structures such as ABA-stacked trilayer graphene (TLG) have not been thoroughly investigated. We report transport studies in ABA-TLG where the effect of Coulomb interactions plays a crucial role in formation of the different orbital/spin/valley symmetries. We explore theoretically and experimentally the effect of magnetic and displacement fields on these symmetries within the $\nu g = 0$ quantum Hall state. Our experimental results indicate at least 5 different phases arise from multiband nature of TLG, with conductance ranging from $0.1e^2/h$, $2e^2/h$ to $4e^2/h$, reflecting the rich interplay between crystal symmetry and Coulomb interactions.

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