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Unusual renormalization group (RG) flow in strongly-disordered monolayer epitaxial graphene CHIEH-WEN LIU, Graduate Institute of Applied Physics, National Taiwan University, LUNG-I HUANG, Department of Physics, National Taiwan University, YANFEI YANG, RANDOLPH E. ELMQUIST, National Institute of Standards and Technology (NIST), SHUN-TSUNG LO, FAN-HUNG LIU, Graduate Institute of Applied Physics, National Taiwan University, CHI-TE LIANG, Department of Physics, National Taiwan University — We present a magneto-transport study on highly disordered, large- area monolayer epitaxial graphene grown on SiC. Quantum Hall-like characteristics are observed even when the sample is in the strongly insulating regime in the sense that the longitudinal resistivity decreases with increasing temperature. Interestingly, the temperature (T)-driven (renormalization group (RG)) flow diagram shows unusual features- a cusp-like structure close to ($\sigma_{xy} = \sigma_{xx} = e^2/h$) where the unstable point in the context of modular group symmetry is predicted. Instead of a quantum phase transition characterized by a T-independent point, a magnetic-field-independent crossing is observed at diagonal conductivity $\sigma_{xx} \sim e^2/h$. Our new experimental results cannot be explained by conventional modular group symmetry and thus suggests further theoretical studies are required.

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