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Tunneling Spectroscopy of Quantum Hall States in Bilayer Graphene KE WANG, ACHIM HARZHEIM, Harvard University, KENJI WATANABE, TAKASHI TANIGUCHI, National Institute for Materials Science, PHILIP KIM, Harvard University — In the quantum Hall (QH) regime, ballistic conducting paths along the physical edges of a sample appear, leading to quantized Hall conductance and vanishing longitudinal magnetoconductance. These QH edge states are often described as ballistic compressible strips separated by insulating incompressible strips, the spatial profiles of which can be crucial in understanding the stability and emergence of interaction driven QH states. In this work, we present tunneling transport between two QH edge states in bilayer graphene. Employing locally gated device structure, we guide and control the separation between the QH edge states in bilayer graphene. Using resonant Landau level tunneling as a spectroscopy tool, we measure the energy gap in bilayer graphene as a function of displacement field and probe the emergence and evolution of incompressible strips.

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