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Quantum Hall Edge Transport Across Graphene monolayer-bilayer junctions YUE ZHAO, Graduate Student, Physics Department Columbia University, MIKITO KOSHINO, Research Associate, Tokyo Institute of Technology, PHILIP KIM, Associate Professor, Physics Department, Columbia University — We experimentally studied the transport property of a graphene monolayer-bilayer junction in the Quantum Hall (QH) regime. Both the monolayer graphene (MG) and the bilayer graphene (BG) develop their own Landau levels under high magnetic field. While the transport measurement shows their distinct QH effect in bulk part of the MG and BG respectively, the transport measurement across their interface exhibits unusual transverse transport behaviors. The transverse resistance across the MG/BG interface is asymmetric for opposite sides of the hall bar, and its polarity can be changed by reversing the magnetic field direction. When the QH plateaus of MG and BG overlap, quantized resistance will appear only on one side of the hall bar electrode pairs across the junction. These experimental observations can be ascribed to the QH edge state transport across the MG/BG interface.

Yue Zhao
Physics Department, Columbia University

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