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Critical Behavior of Four-Terminal Junctions of Bilayer Graphene Domain Walls BENJAMIN WIEDER, FAN ZHANG, CHARLES KANE, University of Pennsylvania — Bilayer graphene in a perpendicular electric field can host domain walls between regions of reversed field direction or interlayer stacking. The gapless modes propagating along these domain walls, while not strictly topological, nevertheless have interesting physical properties, including valley-momentum locking. A junction where four domain walls meet forms the analogue of a quantum point contact. We study theoretically the critical behavior of this junction near the pinch-off transition, which is controlled by a non-trivial quantum critical point. At low temperatures, the transition sharpens and the conductance is described by a universal scaling function, which we compute.

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