Abstract Submitted
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Zero-Bias Anomaly in Quantum Point Contacts[1] YUAN REN, WING-WA YU, SEYED HADI EBRAHIMNEJAD, SERGEY FROLOV[2], JOSHUA FOLK, Department of Physics and Astronomy, University of British Columbia, Vancouver, BC V6T 1Z1, Canada, WERNER WEGSCHEIDER, Laboratorium fur Festkorperphysik, ETH Zurich, 8093 Zurich, Switzerland — Quantum point contacts (QPCs) are narrow constrictions between large reservoirs of two-dimensional electron gas, with conductance quantized in units of $G = 2e^2/h$ at zero magnetic field. Despite decades of investigation, some conductance features of QPCs remain mysterious, one of which is known as the zero-bias anomaly (ZBA) — a conductance peak centered at $V_{\rm sd} = 0$ when the source-drain voltage $V_{\rm sd}$ is swept. Most previous work has focused on ZBAs around the 0.7 structure ($2e^2/h \gtrsim G \gtrsim e^2/h$). Here, we report measurements of the ZBA over a wide range of conductance, from the low-conductance limit ($G \sim 10^{-4}e^2/h$) to well above the first plateau ($G \sim 4 - 6e^2/h$). The qualitatively different dependences on in-plane magnetic field that are observed for ZBAs in different conductance regimes provide insight into the various physical mechanisms responsible for this feature.

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[2]Present address: Kavli Institute of Nanoscience, Delft University of Technology, 2628 CJ Delft, The Netherlands

Yuan Ren
Dept of Physics and Astronomy, University of British Columbia,
Vancouver, BC V6T 1Z1, Canada

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