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Shot Noise Suppression at Non-integer Conductance Plateaus in a Quantum Point Contact NA YOUNG KIM, WILLIAM OLIVER[1], YOSHIHISA YAMAMOTO, Stanford University, YOSHIRO HIRAYAMA, NTT Basic Research Laboratories — We study non-equilibrium differential conductance and current fluctuations in a single quantum point contact. The two-terminal electrical transport properties are measured at 1.5 K as a function of the drain- source voltage and the Schottky split-gate voltage. In differential conductance measurements, conductance plateaus appear at integer multiples of $2e^2/h$ when the drain-source voltage is small, and the plateaus evolve to a fractional of $2e^2/h$ as the drain-source voltage increases. Our shot noise measurements correspondingly show that the shot noise signal is highly suppressed at both the integer and the non-integer conductance plateaus. This main feature can be understood by the induced electrostatic potential model within a single electron picture. In addition, we observe the 0.7 structure in the differential conductance and the suppressed shot noise around 0.7 ($2e^2/h$); however, the previous single-electron model cannot explain the 0.7 structure and the noise suppression, suggesting that this characteristic relates to the electron-electron interactions.

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