

Scanning gate microscopy of the quantum point contact numerical studies: temperature induced interchannel mixing

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We consider a quantum point contact (QPC) opened at the middle of the first, second and third plateaus, connected to the two leads. With the charged tip of an atomic force microscope scanned above the surface of the heterostructure, a depletion region can be capacitively induced in the 2D electron gas in the lead at a distance r from the contact. This scanning gate microscopy (SGM) consists in studying the conductance g of the electron interferometer formed by the nanostructured contact and the depletion region. At the temperature of the order of the plateau width two nearest consecutive channels contribute to g . This results in the thermally induced interchannel mixing effect with the set of the new features in spatial dependence of the conductance.