this case only two plateaus are observed: the lowest mode in the groove has an energy below the contact potential and is not accessible from the leads. If we change the configuration of leads (dashed boxes in Fig. 1d), three plateaus are observed again, see the dashed curve in Fig. 1c. Alternatively, one can obtain the same effect by placing some randomly distributed localized potentials in the groove regions, which act as scatterers. Thus, it is essential from which direction the electrons are injected into the device if this additional groove potential ϕ is present.

We have studied the geometry effects in cleaved edge overgrowth structures on the transmission through quantum wires. As long as the energy of the modes in the wire is *above contact level*, the junction between a wide contact and narrow wire has almost no influence on the transmission while a sharp potential step between contact and wire strongly affects the conduction. In contrast, modes with energies *below the contact level* may be difficult to access. Here the position of the external leads as well as the presence of scattering is of crucial importance.

REFERENCES

[1] A. Yacoby, H.L. Stoermer, N.S. Wingreen, L.N. Pfeiffer, K. W. Baldwin, and K.W. West, Phys. Rev. Lett. **77**, 4612 (1996).

[2] M. Rother, W. Wegscheider, M. Bichler, and G. Abstreiter, in *Proceedings of the 24th Int. Conf. on the Physics of semiconductors*, edited by D. Gershoni (World Scientific, Singapore, 1999).

[3] S. Datta, *Electronic Transport in Mesoscopic Systems* (Cambridge University Press, Cambridge, 1995); D. K. Ferry and S. M. Goodnick, *Transport in Nanostructures* (Cambridge University Press, Cambridge, 1997).

[4] L. Glazman, G. Lesovik, D. Khmel'nitskii, and R. Shekter, JETP Lett. **48**, 238 (1988).

[5] D. Kaufman, Y. Berk, B. Dwir, A. Rudra, A. Palevski, and E. Kapon, Phys. Rev. B **59**, 10433 (1999).
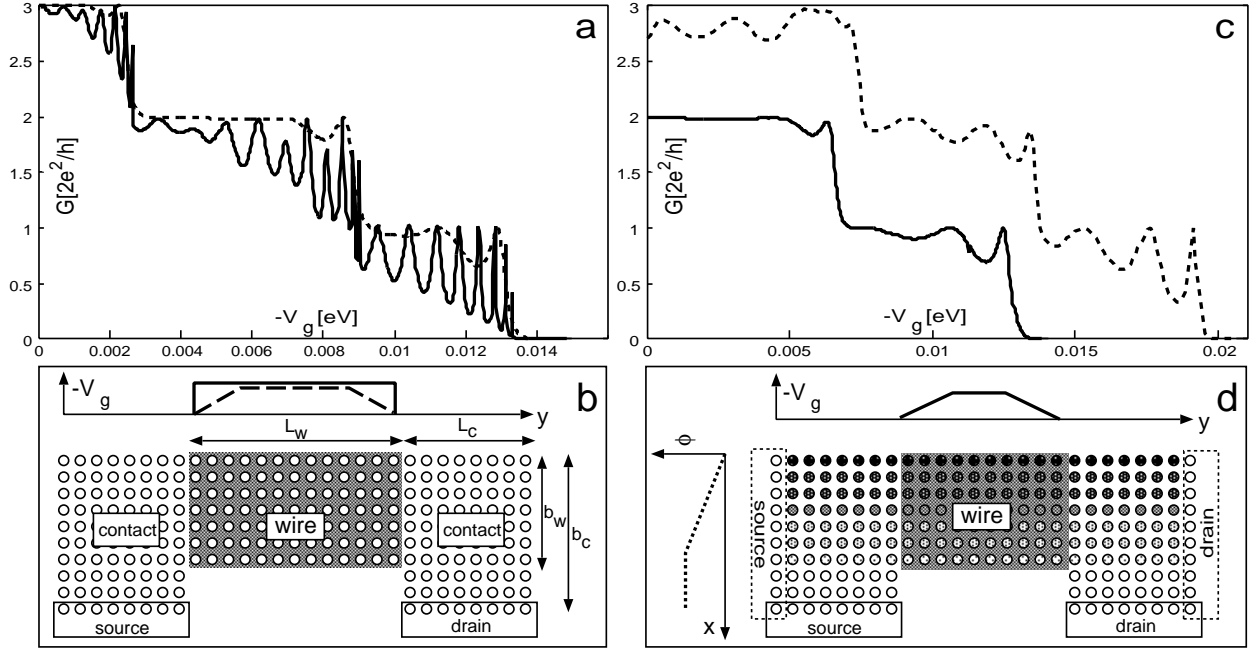
FIG. 1. Conductance G versus gate voltage V_g and scheme of CEO devices with different potential landscapes. (a,b) Rectangular (solid line) and trapezoidal (dashed line) gate potential in the wire (shaded region) for $L_c = 300$ nm, $L_w = 300$ nm. (c,d) Additional attracting potential ϕ close to the CEO interface for different lead configurations: U-shaped (solid source/drain box in (d) with $b_c = 53$ nm, solid curve in (c)) and linear (dashed box in (d) with $b_c = 150$ nm, dashed curve in (c)) for $L_c = 300$ nm, $L_w = 150$ nm. The lengths are not drawn to scale in (b,d).