9.7 cm

PROPERTIES OF THE NANOCONTACTS BETWEEN FERROMAGNETIC MATERIALS: METAL AND HALF-METAL

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We present direct measurements of the conductance of a point contact between the iron tip and a surface of a perovskite electrode at RT. Ferromagnetic perovskite manganites are good materials for testing the quantization effect because of their strong spin polarization. For the predetermined voltage in the range from 0.1 to 5 V we observe that the conductance jumps in units of e^2/h as the tip is pressed or moved back. These results reveal the influence of the spin polarization of ferromagnetic materials on the value of a conductance quantum. Our results show clearly that the conductance is altered by the spin state of the materials in such a way, which is in quite good agreement with Landauer's formula. These experiments thus provide the characteristics of ultimately small contacts consisting of only one to ten atoms. These jumps in the conductance are the results of the abrupt changes in the cross-sectional area of the contact.

13.4 cm

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