Erratum: Direct Observation of the Quantum Tunneling of Single Hydrogen Atoms with a Scanning Tunneling Microscope [Phys. Rev. Lett. 85, 4566 (2000)]

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The expression for the average of the squared particle displacements on p. 4567, used to calculate hopping rates from sequential images of atoms, is too large by a factor of 2. The correct expression is $\langle d^2(t)\rangle = l^2 \nu t$. This error does not affect the conclusions of the Letter. The specific consequences are listed below in the order in which the statements requiring correction appear in the Letter. (1) The H atom hopping rates between 9 and 63 K [Figs. 2(a) and 2(c)] and the D atom hopping rates at 54.4 and 58 K [Fig. 2(a)] are too small by a factor of 2. The corrected version of Fig. 2 is reprinted below as Fig. 1. (2) The hopping rates measured by atom tracking and repeated imaging at 63 K are in good agreement. (3) The attempt frequency and activation energy for D decrease slightly to $\nu_D = 10^{12.6\pm0.2}$ and $E_D = 192 \pm 3$ meV, respectively.

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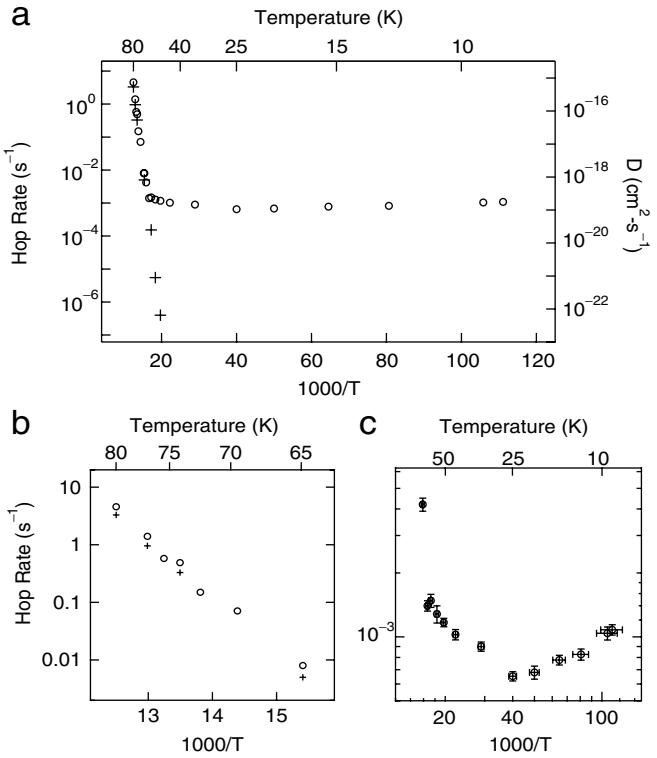

FIG. 1. Classical and quantum diffusion of H and D on Cu(001). (a) Arrhenius plot of the hopping rate of H (∘) and D (+) between 80 and 9 K measured by single-atom tracking (80–65 K) and repeated imaging (63–9 K). The right axis gives the equivalent single particle diffusion constant, D, which is related to the hop frequency ν by the expression $D = 1/4\, l^2 \nu$, where the lattice constant $l = 2.55$ Å. (b) Arrhenius plot of the hopping rate of H (∘) and D (+) atoms determined by single-atom tracking between 65 and 80 K. (c) Log-log plot of the H hopping rate between 63 and 9 K determined by multiple imaging.

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