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Erratum: Direct imaging of dopants in GaAs with cross-sectional scanning tunneling microscopy [Appl. Phys. Lett. 63, 2923 (1993)]

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Figures 1 and 2 of this letter show insufficient detail due to printer's error. These figures with captions are properly reproduced below.

We report the direct imaging of individual electrically active dopants on cross-sectionally cleaved GaAs using scanning tunneling microscopy and compare these results to theory. The observation of these dopants is due to an enhancement in the tunneling current in the neighborhood of an ionized dopant atom in the top several surface layers. In high p-doped GaAs, for tunneling out of the valence band, the dopants in the top several surface layers appear as individual circular hillocks about 2 nm in diameter, superimposed on the As sublattice, as expected. From the size of the hillock and the symmetry of the As

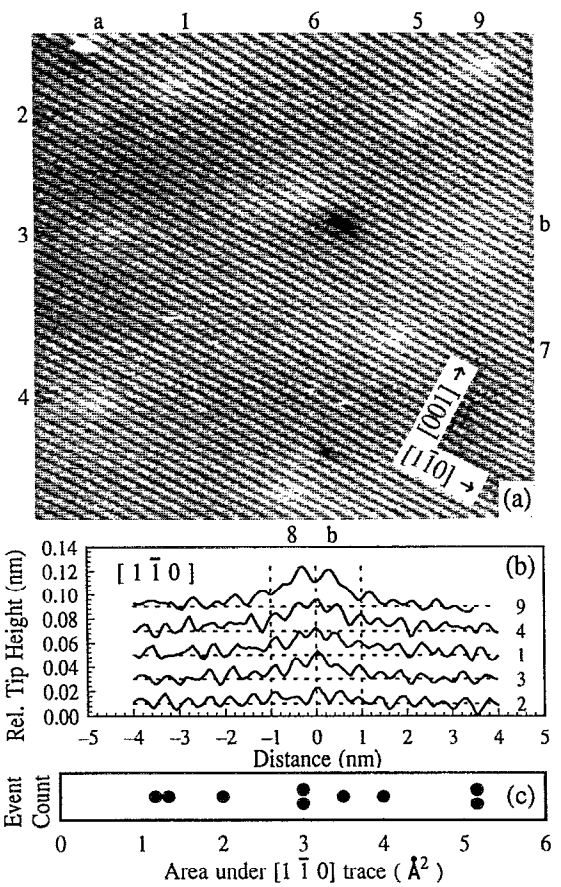

FIG. 1. (a) STM image of a (110)-cleaved, 1×10^{19} cm^{-3}, Be-doped GaAs surface. Image displays 31×29 nm of the As sublattice taken with sample voltage −2.1 V and demand current 0.1 nA. The relative tip height is given by a gray scale, from 0 (black) to 0.2 nm (white). Nine hillocks (dopants) are identified using numbers at the closest point on the perimeter. (b) Tip-height traces along the [1$\bar{1}$0] direction of a selection of the hillocks identified in (a). (c) Scatter plot of area under the [1$\bar{1}$0] tip-height traces (integrated intensity) of all nine hillocks–note the uniform distribution.

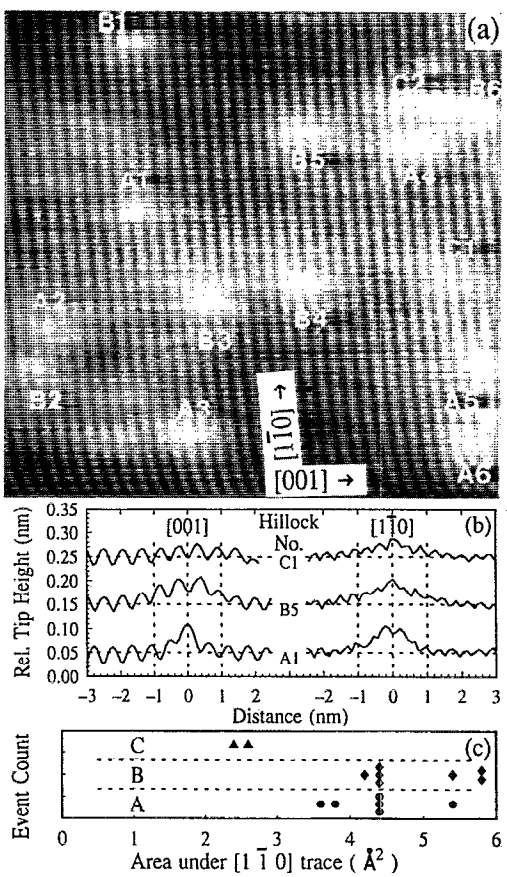

FIG. 2. (a) STM image of a (110)-cleaved, 5×10^{19} cm^{-3}, Zn-doped GaAs surface. Image displays 20×28 nm of the As sublattice taken with sample voltage −2.1 V and demand current 0.1 nA. The relative tip height is given by a gray scale, from 0 (black) to 0.2 nm (white). Six type A hillocks, six type B hillocks, and one type C hillock are identified with numbers. (b) Tip-height traces along the [1$\bar{1}$0] and [001] directions of a selection of the hillocks of types A, B, and C identified in (a). (c) Scatter plot of area under the [1$\bar{1}$0] tip-height traces (integrated intensity) for all labeled hillocks.

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