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Theoretical analysis on the effect of tip-induced band bending on scanning tunneling spectroscopy measurements on H-terminated Si(100) surface HIDEOMI TOTSUKA, totsuka.hideomi@nihon-u.ac.jp, SATOSHI WATANABE, watanabe@cello.t.u-tokyo.ac.jp — Scanning tunneling spectroscopy (STS) is widely used experimental technique. However, theoretical study on STS is not sufficient yet, in the sense that the effects of important factors such as the tip-induced band bending (TIBB) in measurements on semiconductor surfaces have not been examined yet. In this study, we have analyzed the STS spectra on a H-terminated Si(100) surface theoretically using a method [1] which can calculate the electron states under applied bias voltages self-consistently. We found that the band gap in the STS spectra is larger than that in the density of states in our calculation. Furthermore, we found that this cannot be understood from TIBB, while the bias voltage dependence of TIBB in our calculation corresponds well with experimental result [2]. [1] Y. Gohda et al., Phys. Rev. Lett. 85, 1750 (2000). [2] M. McEllisterm, et al., Phys. Rev. Lett. 70, 2471 (1993)

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