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Multi-state tunneling conductance of Si (100) dimers at 4 K YAN PENNEC, DAVID FORTIN, MARK FREEMAN, Department of Physics, University of Alberta, Edmonton, AB T6G 2J1, Canada , MICHAEL HORN VON HOE-GEN, Institut für Experimentelle Physik 45117 Essen, Germany Institut für Experimentelle Physik 45117 Essen, Germany — We present an STM measurement of the Si(100) surface at 4 K. It shows various phase reconstructions depending on the tunneling conditions, and some flickering dimers. We recorded the telegraph-noise-like spectrum on top of a single dimer. Instead of the thermally activated bi-stable system measured previously at 80 K (Hata et al PRL 86, 3084 (2001)), we found an 8-state system. We correlate the 8 states with the 2^3 possible conformations between the measured dimer row and its first neighbors along [-110]. The discrete conductance levels found at a fixed position are found to split, crossover and branch in a spatially-resolved scan across a single dimer row. The excitation of the dimer flickering appears driven by the interaction of the hot electrons and the dimers. This new data exposes a significant electronic transport between the rows, a point which has been ignored in most modeling of the surface. Work supported by iCORE and CIAR.

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