Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Local potential profile and confined states on the Si(111)- $\sqrt{3}$ x $\sqrt{3}$-Ag surface by scanning tunneling spectroscopy MASANORI ONO, Y. NISHIGATA, T. NISHIO, T. EGUCHI, Y. HASEGAWA — It has been known that on the Ag-covered Si surface forms two-dimensional metallic states, like the cases of (111) surface of the noble metals, in the band gap of the semiconductor substrate. Confined potential around defects and steps on the surface might, therefore, create 0D and 1D electronic states, respectively. We investigated in two-dimensional tunneling spectroscopic measurements using low-temperature (6K) STM how the electrical potential changes and what kinds of electronic states are formed around these sites. Our STS measurements reveal that the steps and Ag-adatom induced defects lower the potential around them. It is found that the potential variation around step edges spreads in a range of a few nm and can be fitted well with a 2D Thomas-Fermi screened potential. These can be explained with a model of positive charging at the step edges. Electronic states related with the varied potential were also observed and their details will be discussed in the presentation.

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Date submitted: 01 Dec 2004 Electronic form version 1.4