

Abstract Submitted  
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**Direct evidence of the surface state contribution to the Kondo resonance** QING LI, ISSP, Univ. Tokyo and Inst. Phys., CAS, SHIRO YAMAZAKI, TOYOAKI EGUCHI, ISSP, Univ. Tokyo, HOWON KIM, SE-JONG KAHNG, Dept. Phys., Korea Univ., JINFENG JIA, QIKUN XUE, Inst. Phys., CAS and Tsinghua Univ., YUKIO HASEGAWA, ISSP, Univ. Tokyo — We performed low temperature scanning tunneling microscopy/spectroscopy on the isolated single 5, 10, 15, 20-tetrakis-(4-bromophenyl)-porphyrin-Co (TBrPP-Co) molecules adsorbed on the Si(111)- $\sqrt{3}\times\sqrt{3}$  Ag substrate. On this substrate, all the TBrPP-Co molecules show a square shape, indicating a planar conformation with a spin-active Co atom caged at its center. As the substrate supports a two-dimensional surface state and does not have bulk state near the Fermi level, the observed Fano-shaped peak near the Fermi level taken above the single molecule is a direct evidence of the contribution of the surface state electrons to the Kondo resonance. The long decay length ( $\sim 1.4$  nm) of the resonance also support for the surface state contribution. [1] Q. Li, S. Yamazaki, T. Eguchi, Y. Hasegawa, H. Kim, S.-J. Kahng, J. F. Jia, and Q. K. Xue, *Nanotechnology* 19, 465707 (2008).

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