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Visualization of quasiparticle interference on the surface of $SrVO_3$ film YOSHINORI OKADA, AIMR, Tohoku University, Japan, TAY-RONG CHANG, National Tsing Hua U., Taiwan, RYOTA SHIMIZU, AIMR, Tohoku University, Japan, GUOQING CHANG, National University of Singapore, HORNG-TAY JENG, National Tsing Hua U., Taiwan, SUSUMU SHIRAKI, AIMR, Tohoku University, Japan, HSIN LIN, National University of Singapore, TARO HITOSUGI, AIMR, Tohoku University, Japan — Establishing the atomic level mechanism leading to long-lived 2D quasiparticle state (*coherent 2D electronic state*) at surface/interface of perovskite oxide has been an important challenge since such electronic state can host many interesting quantum phenomena. In this study, we probed the electronic structure of $SrVO_3$ (001) thin film surface by means of spectroscopic imaging scanning tunneling microscope, which is an ideal approach to probe coherent 2D electronic nature via observation of quasiparticle interference (QPI). For the first time in perovskite oxide, we report the QPI on a $SrVO_3$ (001) thin film surface and reveal that the surface of $SrVO_3$ is a coherent 2D electronic state. Moreover, we observed that apical oxygen is present on VO_2-terminated top-most plane. In combination with band calculation, we will discuss the atomic scale mechanism of how coherent 2D electronic state emerges on surface of $SrVO_3$, whose bulk electronic state has one electron in degenerated t_{2g} level.

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