

Abstract Submitted
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Atomic charge state determination by AFM LEO GROSS, FABIAN MOHN, PETER LILJEROTH, IBM Research - Zurich, 8803 Rueschlikon, Switzerland, JASCHA REPP, FRANZ GIESSIBL, Institute of Experimental and Applied Physics, University of Regensburg, 93040 Regensburg, GERHARD MEYER, IBM Research - Zurich, 8803 Rueschlikon, Switzerland — We investigated the charge state switching of individual gold and silver adatoms on ultrathin NaCl films on Cu(111) using a qPlus tuning fork atomic force microscope (AFM) operated at 5 Kelvin with oscillation amplitudes in the sub-Ångstrom regime. Charging of a gold adatom by one electron charge increased the force on the AFM tip by a few piconewtons. Employing Kelvin probe force microscopy (KPFM) we also measured the local contact potential difference (LCPD) as a function of the tip height above differently charged adatoms. We observed that the LCPD is shifted depending on the sign of the charge and allows the discrimination of positively charged, neutral, and negatively charged atoms. [L. Gross, et al., Science 324, 1428 (2009)]

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