

Direct sub-nano scale demonstration of some textbook examples utilizing spin-polarized scanning tunneling microscopy

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Abstract

Spin-polarized scanning tunneling microscopy and spectroscopy (spin-STM/S) has been successfully applied to magnetic characterizations of individual nanostructures. In spite of the pivotal role of the tip, the contribution of the tip in spin-STM/S has rarely been investigated in detail. In this talk, an advanced analysis of spin-STM/S data measured on magnetic nanoislands, which relies on a quantitative magnetic characterization of tips, will be discussed. In-field spin-STM on Co bilayer nanoisland on Cu(111) has enabled a quantitative determination, and thereby, sub-nanoscale demonstration of some textbook issues in the field of nanomagnetism. The resulting in-depth and conclusive analysis of magnetic characterization of the tip opens new venues for a clear-cut sub-nanometer scale spin ordering and spin-dependent electronic structure of the non-collinear magnetic state in bilayer high Fe nanoislands on Cu(111).

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