

“Nanoscale magnetometry on single cobalt atoms and cobalt nano structures on surfaces by spin-resolved scanning tunneling microscopy”

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In the seminar, two topics investigated by spin-polarized STM will be presented. The first topic is about atomic-scale magnetic imaging of single cobalt atoms deposited on manganese monolayers on W(110). Spin-selective imaging of orbital states of individual atoms is achieved by spin-polarized STM. We take advantage of the spin-selective orbital imaging of cobalt atoms to identify their spin direction. By laterally moving atoms on the magnetic template, the spin direction can also be controlled while maintaining magnetic sensitivity [1]. The second topic is about nanoscale magnetization measurements on Co nano-islands on Ag(111). We find peculiar coexistence of perpendicular and in-plane magnetized Co nanoscale islands on Ag(111) surface, and the unique relationship between the moire corrugation amplitude and the magnetization direction of the islands; strong moire islands show the perpendicular magnetization and weak moire ones do the in-plane. Density function theory calculations reproduce the relationship between the structural, electronic, and magnetic properties, and explain the difference between the islands with the effect of a fcc stacking fault in an intrinsic hcp stacking [2].

REFERENCES

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- [2] K. Doi, E. Minamitani, S. Yamamoto, Y. Yoshida, S. Watanabe, and Y. Hasegawa (to be published).