Electric Field as Switching Tool for Magnetic States in Atomic-Scale-Nanostructures

VALERI STEPANYUK, Max-Planck Institute of Microstructure Physics, Halle, Germany

We present the state of the art ab initio studies of the effect of the external electric field on electronic, magnetic and transport properties of atomic-scale nanostructures on metal surfaces. We demonstrate a possibility of a local control and switching of magnetism in such nanostructures [1]. The effect of the electric field on surface-state electrons is discussed [2]. Our results reveal that the local spin-polarization of electrons and the local magnetoresistance on nanoislands can be tuned by the electric field [3,4]. Our studies give a clear evidence that an external surface charging can strongly affect substrate-mediated exchange interactions [5].