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

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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].

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