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Ferromagnetic STM tip operating as a Spin-diode[1] POLIANA H. PENTEADO, University of São Paulo, FABRICIO M. SOUZA, Federal University of Uberlândia, ANTÔNIO C. SERIDONIO, UNESP, RENATO M. COUTINHO, EDSON VERNEK, Federal University of Uberlândia, J. CARLOS EGUES, University of São Paulo — We study spin-dependent transport in a system composed of a ferromagnetic STM tip coupled to an adsorbed atom (adatom) and to a host metallic (non-magnetic) surface. Electrons can tunnel directly from the tip to the surface or through the adatom. Our calculation is based on the nonequilibrium Green functions technique (Keldysh formalism). We self-consistently calculate the adatom spin occupation and its magnetization as a function of the tip position. We find that the adatom becomes magnetized when the tip approaches it; this magnetization switches sign as the voltage changes from forward to reverse bias. We also calculate the spin-resolved currents. If the tip is near the adatom, we obtain the spin-diode effect [PRB **75**, 165303 (2007)] - i. e., unpolarized current for positive bias and polarized current for reverse bias - when the adatom is singly occupied. We also observe Friedel oscillations in the current as the tip-adatom distance increases [F. M. Souza, P. H. Penteado, et al. - to be submitted].

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