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How to probe transverse magnetic anisotropy of a single-molecule magnet by electronic transport?[1] M. MISIORNY, Chalmers UT, Sweden and Adam Mickiewicz Univ., Poland, E. BURZURI, R. GAUDENZI, Delft UT, The Netherlands, K. PARK, Virginia Tech, USA, M. LEIJNSE, Lund Univ., Sweden, M. WEGEWIJS, FZ Jülich, Germany and RWTH Aachen, Germany, J. PAASKE, Univ. of Copenhagen, Denmark, A. CORNIA, Univ. of Modena and Reggio Emilia, Italy, H. VAN DER ZANT, Delft UT, The Netherlands — We propose an approach for *in-situ* determination of the transverse magnetic anisotropy (TMA) of an individual molecule by electronic transport measurements, see Phys. Rev. B **91**, 035442 (2015). We study a Fe4 single-molecule magnet (SMM) captured in a gateable junction, a unique tool for addressing the spin in different redox states of a molecule. We show that, due to mixing of the spin eigenstates of the SMM, the TMA significantly manifests itself in transport. We predict and experimentally observe the pronounced intensity modulation of the Coulomb peak amplitude with the magnetic field in the linear-response transport regime, from which the TMA parameter E can be estimated. Importantly, the method proposed here does not rely on the small induced tunnelling effects and, hence, works well at temperatures and electron tunnel broadenings by far exceeding the tunnel splittings and even E itself. We deduce that the TMA for a single Fe4 molecule captured in a junction is substantially larger than the bulk value.

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