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Cotunneling signatures of spin-electric coupling in frustrated triangular single-molecule magnets JAVIER NOSSA, CARLO CANALI, School of Computer Science, Physics and Mathematics, Linnaeus University, SE-39182 Kalmar, Sweden — The ground state (GS) of frustrated (antiferromagnetic) triangular single-molecule magnets is characterized by two total-spin $S = 1/2$ doublets with opposite chirality. According to a group theory analysis [M. Trif *et al.*, Phys. Rev. Lett. **101**, 217201 (2008)] an external electric field can efficiently couple these two chiral spin states, even when the spin-orbit interaction (SOI) is absent. The strength of this coupling, d, is determined by an off-diagonal matrix element of the dipole operator, which can be calculated by *ab-initio* methods [M. F. Islam *et al.*, Phys. Rev. B **82**, 155446 (2010)]. In this work we propose that Coulomb-blockade transport experiments in the cotunneling regime can provide a direct way to determine the spin-electric coupling strength. Indeed, an electric field generates a d-dependent splitting of the GS manifold, which can be detected in the inelastic cotunneling conductance. Our theoretical analysis is supported by master-equation calculations of quantum transport in the cotunneling regime. We employ a Hubbard-model approach to elucidate the relationship between the Hubbard parameters t and U, and the spin-electric coupling constant d. This allows us to predict the regime in which the coupling constant d can be extracted from experiment.

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