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Shot noise at spin-dependent hopping in tunnel junctions with ferromagnetic electrodes VIKTOR SVERDLOV, SIEGFRIED SELBERHERR, Institute for Microelectronics, TU Wien — Although resistance modulation with magnetic field due to spin-dependent resonant tunneling [1] is likely responsible for a larger signal than expected from spin accumulation measured within a three-terminal spin injection setup [2], the reason for the discrepancy is still under scrutiny [3]. An additional characteristic capable to distinguish between spin-dependent trap-assisted tunneling and spin accumulation due to direct tunneling is needed. We calculate the shot noise at spin-dependent hopping and demonstrate that, due to the Pauli spin blockade in a magnetic field parallel to the magnetization of the ferromagnetic contacts, the Fano factor is significantly enhanced above its value at direct tunneling. Only in this case the spin-dependent tunneling rates are determined by the two spin-up and spin-down eigenvalues of a 4×4 non-symmetric transition matrix, while in the general case all four eigenvalues contribute into the transition rate. This explains the discrepancy between [1] and [4], where only the two eigenstates are considered. 1.Y.Song and H.Dery, PRL **113**, 047205 (2014). 2.R.Jansen, Nature Materials **11**, 400 (2012). 3.A.Spiesser *et al.*, Appl.Phys.Express **9**, 103001 (2016). 4.Z.Yue *et al.*, PRB **91**, 195316 (2015).

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