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Probing a SET nanomagnet with shot noise. L.D. CONTRERAS-PULIDO, Instituto de Ciencia de Materiales de Madrid, CSIC, Spain., J. FERNANDEZ-ROSSIER, Universidad de Alicante, Spain., R. AGUADO, Instituto de Ciencia de Materiales de Madrid, CSIC, Spain. — Although recent experiments show that single atomic spins [1] and molecular magnets [2] can be proved via transport measurements, their magnetic properties can hardly be tuned once they are fabricated. In a recent Letter [3], we have shown that a single-electron transistor (SET) based upon a II–VI semiconductor quantum dot and doped with a single-Mn ion behaves like a quantum nanomagnet with magnetic properties which can be controlled electrically. Conversely, the electrical properties of this SET depend on the quantum state of the Mn spin. Here, we extend these previous ideas and study the shot noise of this kind of nanomagnets. Our results reveal that shot noise contains much more information that the one contained in the average current. Interestingly, important quantities of the nanomagnet like the spin relaxation time and information about current-induced spin precession can be directly extracted from shot noise measurements. [1] Cyrus F. Hirjibehedin et al, Science, 317, 1199 (2007). [2] Moon-Ho Jo et al, Nanoletters, 6, 2014, (2006); H. B. Heersche et al., Phys. Rev. Lett. 96, 206801 (2006). [3] J. Fernandez-Rossier and R. Aguado, Phys. Rev. Lett. 98, 106805 (2007).

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