

Abstract Submitted
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Shot noise in Cr-doped and undoped Co/Al₂O₃/Py magnetic tunnel junctions¹ FARKHAD ALIEV, RUBEN GUERRERO, Departamento de Física de la Materia Condensada, C-III, Universidad Autónoma de Madrid, Cantoblanco, 28049, Madrid, Spain, PATRICK LE CLAIR², JAGADEESH MOODERA, Massachusetts Institute of Technology, Massachusetts 02139, USA — We have found that shot noise in Co(80Å)/Al₂O₃(14Å)/Py(100Å) magnetic tunnel junctions (MTJs) is reduced with respect to Poissonian value. The Fano factor, obtained at frequencies ($100 < f < 1000$ Hz), temperatures ($T < 10$ K) and biases (below 150 meV) where the shot noise dominates, varies between $F \approx 0.8$ and 0.65 , indicating correlated electron tunnelling. Doping of the insulating barrier with Cr inclusions suppresses the conductivity and tunnelling magnetoresistance, and restores the Fano factor to a value corresponding to uncorrelated transport ($F \approx 1$). These results indicate an enhanced cross-correlation between electrons due to trapping or spin-flip assisted tunnelling in the undoped MTJs, and a possible Coulomb blockade in the Cr doped MTJs.

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