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**Spin transfer torque in ferroelectric tunnel junctions** ARTHUR USEINOV, King Abdullah University of Science and Technology (KAUST), Physical Science and Engineering Division, Thuwal 23955-6900, Saudi Arabia., AURELIEN MANCHON, King Abdullah University of Science and Technology (KAUST), Physical Science and Engineering Division, Thuwal 23955-6900, Saudi Arabia — The worldwide interest for spintronics grows up every year, magnetic oscillators and resistance switchers became an important part of electronics with promising applications such as tunable microwave radiation, magnetic memory cells, magnetic field sensors, etc. A non-equilibrium spin-dependent transport in magnetic tunnel junctions comprising a ferroelectric barrier was studied. The exact solutions of the free electron Schrödinger equation for electron tunneling in the presence of interfacial screening are obtained by Bessel and Airy functions. As a result, bias-dependence of the tunneling magneto- and electro-resistance are obtained. The barrier asymmetry induced by the ferroelectric polarization produces strong modifications compared to regular tunnel junctions in the bias-dependence of the transport properties. Furthermore, manipulating the electric polarity of the barrier provides a way to control the magnitude and sign of the spin transfer torque.

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