

Abstract Submitted
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Theory of the spin-orbit induced anisotropy in the tunneling magnetoresistance of magnetic tunnel junctions.¹ ALEX MATOS-ABIAGUE, JAROSLAV FABIAN, Institute for Theoretical Physics, University of Regensburg, 93040 Regensburg, Germany — We investigate the effects of the spin-orbit interaction on the tunneling magnetoresistance of magnetic tunnel junctions. We propose a theoretical model in which the two-fold symmetry of the tunneling anisotropic magnetoresistance (TAMR) effect, observed in Fe/GaAs/Au tunnel junctions, originates from the interference between Dresselhaus and Bychkov-Rashba spin-orbit couplings at the interface between the ferromagnetic (Fe) region and the GaAs tunnel barrier. Bias induced changes of the Bychkov-Rashba spin-orbit coupling can result in a flipping of the axis of the two-fold symmetry of the TAMR. The theoretical calculations are in good agreement with recent experiments [1].

[1] J. Moser, A. Matos-Abiague, D. Schuh, W. Wegscheider, J. Fabian, and D. Weiss, cond-mat/0611406.

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Alex Matos-Abiague
Institute for Theoretical Physics, University of Regensburg

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