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Spin Dependent Transport in Magnetic Tunneling Junctions[1]
MAGDA ANDRADE, University of Arizona, WANG LAB TEAM — Magnetic Tunneling Junctions (MTJ) are the basis for developing future high density and lower energy devices, such as applications for magnetic random-access memory (MRAM) or read heads of a Hard Disk Drive. MTJs are spin-dependent devices that consist of a sandwich-like structure of ferromagnet-insulator-ferromagnet (FM/I/FM) layers, where each FM has their own magnetization under an external magnetic field or spin polarized current, where switching can be achieved. Furthermore, in order to achieve such an advancement, our goal is to get higher Tunneling Magnetoresistance (TMR) by employing new materials, new structures, or new fabrication processes. Here we investigated the effectiveness of using an epitaxial layer, MgO barrier, and determining the barrier thickness to achieve large spin-polarization which will help us achieve high TMR. Furthermore, through a wide range of samples, I will illustrate the correlation between TMR and barrier thickness in MTJs with in-plane and perpendicular anisotropy..

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