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Controlling the magnetic properties of a ferromagnetic film using a ferroelectric layer AARUSHI KHANDELWAL, PINGFAN CHEN , GAN MOOG CHOW, Natl Univ of Singapore — Magnetoelectric multiferroics are materials that simultaneously support both ferroelectricity and ferromagnetism. They are of interest for new devices because they allow multiple tunable functionalities to be incorporated in the same material and provide new degrees of freedom. One way to engineer such materials is to construct a composite multiferroic, a heterostructure of a ferromagnetic layer and a ferroelectric layer where the magnetoelectric effects originate from the interfacial coupling. This talk will characterize the nature of this interfacial coupling in a multiferroic heterostructure of LSMO/PZT. It will elaborate on the two main coupling mechanisms present: oxygen octahedral rotation and magnetoelectric coupling. It will also describe the techniques and models used to grow the samples and quantify the impact of these coupling mechanisms on the heterostructure's structural, magnetic, and electronic properties. Thus, it will explore how the magnetic properties of the LSMO layer (Curie temperature, magnetic moment per Mn ion, coercivity, and magnetoresistivity) can be tuned using the ferroelectric PZT layer. Finally, it will also summarize the potential applications of such a heterostructure in spintronics, data storage, and magnetoresistive sensors.

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