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Interface magnetism of two functional epitaxial ferromagnetic oxides integrated with Si (100) SRINIVASA RAO SINGAMANENI, North Carolina State University, J.T PRATER, Army Research Office, FAN WU, J. NARAYAN, North Carolina State University — Here, we report on the interface magnetic coupling of $La_{0.7}Sr_{0.3}MnO_3/SrRuO_3$ (LSMO/SRO) bilayer integrated with the technologically important substrate Si (100). We have taken a new approach[1] with which LSMO/SRO bilayer has been epitaxially integrated with Si(100). Magnetization data[2] collected as a function of biasing layer (SRO) and biased layer (LSMO) thicknesses reveal astonishing evolution of magnetic characteristics. Notable observations include: tunable coercive field (6334-489Oe), exceptional magnetization reversal, intrinsic positive exchange bias, crossover from ferromagnetic to anti-ferromagnetic interface exchange coupling accompanied by additional increase in coercive field as a function of cooling field, double shifted hysteresis loops, and tuning of LSMO Curie temperature. We discuss these emergent physical phenomena in the context of strong interplay among Zeeman, anisotropy and exchange energies. These results have important implications for the physics of exchange biased systems, constitute a significant step in the field of interface magnetism and functional magnetic devices.

[1]Narayan *et al* J. Appl. Phys. **93**, 278 (2003).
[2]S. S. Rao *et al* under preparation (2013).

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