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【234】Probing the origin of ferromagnetic stability in LSMO/SRO

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In this project we used X-ray Absorption Spectroscopy,X-ray Linear and Magnetic Circular Dichroism at the Mn $L_{3,2}$-edges to understand the ferromagnetic stability in $La_{0.7}Sr_{0.3}MnO_3$(LSMO) when interfaced with $SrRuO_3$(SRO),which is absent for the LSMO//$SrTiO_3$(STO).It has been proposed that charge transfer at the interface between LSMO and SRO allow the $dx^2 - y^2$ orbital to mediate the in-plane double exchange,which stabilizes the ferromagnetic ordering of LSMO down to 1-2 unit cells.We have probed the orbital anisotropy and magnetism of LSMO in LSMO/SRO bilayers varying thickness of LSMO(2/4/8/15 u.c.) and SRO(3/20 u.c.).Antiferromagnetic coupling of 2 and 4 u.c. LSMO with SRO was observed even below critical thickness of LSMO.LSMO/SRO data shows $d3z^2 - r^2$ preferential occupation below 15 u.c LSMO.Our result is in agreement with theoretical prediction.

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