Magnetism and superconductivity in oxide ferromagnet/superconductor heterostructures

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The studies of superconductor/ferromagnet (S/F) artificial heterostructureattract attract much attention. Using such structure it is possible to probe in detail the interplay between superconductivity and ferromagnetism at nanometer length scale. Recent theoretical model [1] predicts the existence of indirect exchange coupling between ferromagnetic layers across the superconducting layers, similar to the coupling in GMR systems. The theory suggests that the most relevant heterostructure to observe such effect are structures composed of manganites with colossal magnetoresistance effect (CMR) and high temperature superconductors (HTSC). In this report we describe recent experimental results [2-4] of the structure, transport and magnetic studies of CMR/HTSC heterostructures. Experimental results support the existence of indirect exchange coupling.

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