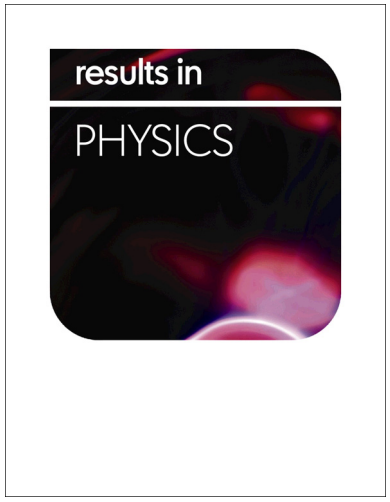

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The correlation between superconductivity and ferromagnetism in superconductor-ferromagnet heterostructures

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Abstract

The correlation between superconductivity and ferromagnetism through a magnetic coupling at the interface between the heterostructure constructed by high temperature superconductor and ferromagnet layers was theoretically investigated. The investigation results represent a fact that the superconductor and the ferromagnet affect mutually and the increase of the magnetic coupling will simultaneously suppress the ferromagnetism and the superconductivity. The dominant mechanism of the result is owing to the carrier exchange between both layers determined by the magnetic coupling strength and each layer's orbital energy. The increase in the number of carriers will enhance the superconductivity as well as the ferromagnetism but with too many of carriers in the ferromagnet, the ferromagnetism will be suppressed by over spin screening.

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