

Abstract Submitted
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Origin of superconductivity and ferromagnetism in Bi/Ni/Bi sandwich trilayers¹ WEIWEI ZHAO, Center for Nanoscale Science and Physics Department, PSU, CUI-ZU CHANG, Francis Bitter Magnet Lab, MIT, DUK-Y KIM, Physics Department, PSU, JAGADEESH MOODERA, Francis Bitter Magnet Lab and Physics Department, MIT, MOSES CHAN, Center for Nanoscale Science and Physics Department, PSU — Coexistence of superconductivity and ferromagnetism was experimentally observed in Bi/Ni bilayers [PRL 94, 037006 (2005)]. To reveal the origin of the superconductivity in this system, we here systematically studied the superconductivity and the ferromagnetism in Bi/Ni/Bi trilayers, Bi/Ni bilayers and Ni/Bi bilayers. We found the superconducting transition temperature to be independent of the thickness of Ni layers from 1nm to 45nm in Bi/Ni/Bi trilayers. The superconducting critical magnetic fields of trilayers were higher than those of bilayers. In addition, we observed conventional ferromagnetism in both trilayers and bilayers. These observations can be explained by a model that the superconductivity originates from the Bi/Ni interfaces with spin triplet pairing.

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