Spin-flipping with conical magnets: Superconducting Proximity effects in bi- and multilayers

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The long-range proximity effect through a ferromagnet or half-metal of provides a link between superconductivity and spintronics [1]. This long-range proximity effect can occur if the interface region allows for spin-flip process. One source of such a spin-flip process is provided by a conical magnet, e.g. Holmium. Here, we present results based on self-consistent solutions of the microscopic Bogoliubov-de Gennes equations in the clean limit incorporating a tight-binding model [2]. The effects of both, a general conical magnet and the special case of Holmium, on the generation of equal-spin spin-triplet pairing correlations will be shown. The effects of the conical magnet's angles on the equal-spin spin-triplet pairing will be discussed and analysed. The influence of Holmium and ferromagnetic layer thickness on the equal-spin spin-triplet correlations will be discussed in conjunction with experimental results on Holmium containing heterostructures [3].

References:

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Supported by EPSRC grant EP/I037598/1