Andreev transport through a magnetic molecule

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The Andreev transport through a single molecular magnet coupled to two external ferromagnetic leads and one superconducting lead is studied theoretically by means of the real-time diagrammatic technique. The calculations are performed by including the sequential tunneling processes between the molecule and ferromagnetic leads, while the coupling to superconductor can be arbitrary. We analyze the dependence of the Andreev current, differential conductance and tunnel magnetoresistance on various intrinsic parameters of the molecule. The interplay between superconducting proximity effect and the possibility of tunneling through excited states of the molecule gives rise to the splitting of Andreev bound states. Moreover, by studying the behavior of the tunnel magnetoresistance, which quantifies the amount of crossed Andreev reflection compared to direct Andreev tunneling, we discuss the possibility of using magnetic molecules for Cooper pair splitting.

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