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### **Magnetic excitations of molecular spins on a superconductor**

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Single magnetic molecules on a superconducting substrate present a model system to study the influence of a local magnetic moment on the superconducting state at the atomic scale. The magnetic moment of the adsorbate interacts with the Cooper pairs by exchange coupling and tends to break them apart [1]. Signatures of this interaction are localized states in the superconducting gap, which can be probed by tunneling spectroscopy [2,3]. On the other hand, the quasi-free electrons in the substrate screen the localized spin via the Kondo effect. The delicate balance between these phenomena determines the resulting ground state of the system. Using scanning tunneling spectroscopy, we show that the interaction of paramagnetic molecules with a superconducting lead surface is very sensitive to the details of the atomic scale surrounding [4]. Depending on the interaction strength, the magnetic moment is able to perturb the Cooper pairs, or the superconducting state is unaffected.

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