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Molecular magnetic coupling at atomic scale JINFENG JIA, Department of Physics, Tsinghua University, Beijing 100084, China, YINGSHUANG FU, SHUAIHUA JI, Institute of Physics, The Chinese Academy of Sciences, Beijing 100080, China, XI CHEN, Department of Physics, Tsinghua University, Beijing 100084, China, XUCUN MA, Institute of Physics, The Chinese Academy of Sciences, Beijing 100080, China, QIKUN XUE, Department of Physics, Tsinghua University, Beijing 100084, China — Understanding and manipulating magnetic interactions between molecules is not only meaningful to molecular magnetism, but also expected to have profound impact on the development of molecular spintronics and quantum computation. Tunneling spectroscopy of CoPc multilayer prepared on nanometer-sized Pb islands on Si(111) were measured with a subkelvin temperature scanning tunneling microscope. We observed magnetic excitations of coupled molecular spins via inelastic electron tunneling spectroscopy, and determined the coupling strength between CoPc adjacent layers with Heisenberg model. We further demonstrate the coupling between molecules, and coupling of single-molecule spin with metallic host can both be manipulated by changing their stacking sequence via molecular manipulation.

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