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Electron transport studies of superconducting Pb single-electron tunneling transistors KANG LUO, ZHEN YAO, Department of Physics, The University of Texas at Austin, Austin, TX 78712 — We investigate the electronic transport properties of superconducting Pb single-electron tunneling transistors created by electromigration of Pb nanowires. In the superconducting state, the conductance is suppressed by a combination of the Coulomb blockade effect and the absence of density of states within the superconducting gap. The tunneling spectroscopy at 2 K shows a strong even-odd parity effect which is smeared out at 4.2 K. Upon application of a magnetic field, the superconducting state is suppressed and single-electron tunneling behavior for normal metallic nanoparticles is recovered. We will present a theoretical model and compare it with our experimental data.

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