Abstract Submitted
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Suppression of superconductivity in nanowires by bulk superconductors[1] MINGLIANG TIAN, NITESH KUMAR, SHENGYONG XU, JINGUO WANG, JAMES KURTZ, MOSES CHAN, The Center for Nanoscale Science and Department of Physics, The Pennsylvania State University, University Park, Pennsylvania 16802-6300, JINGUO WANG TEAM — Transport measurements were made on a system consisting of zinc nanowire array sandwiched between two bulk superconductors (Sn, In and Pb). It was found that the superconductivity of Zn nanowires could be unexpectedly suppressed by the existence of two mass superconducting reservoirs. The degree of suppression effect is found to closely depend on the diameter and length of the Zn nanowires, as well as the bulk materials (stronger with Sn and weaker with Pb). When a magnetic field (H) is applied and drives the bulk superconductors into the metallic state, the superconducting drop near T_c of the Zn nanowires reappears or assumes its full magnitude, indicating the ZNWs have switched back to their superconducting state. Our systematic study demonstrates that this unexpected phenomenon is probably related to the one-dimensional character of zinc nanowires and the interaction of nanowires with the strong bulk superconducting reservoirs.

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