Abstract Submitted
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Transport properties of hybrid superconductor/ferromagnet nanowires fabricated by electrodeposition.[1] NITESH KUMAR, JIAN WANG, QI ZHANG, MINGLIANG TIAN, MOSES H.W. CHAN, Center for Nanoscale Science, Penn State University — We have fabricated multilayer nanowires with alternating superconducting and ferromagnetic segments using template-based electrodeposition. Nanowires are fabricated with different diameters and length, with individual segments on the length scale of few hundreds of nm to few microns, using both porous polycarbonate and anodized alumina membranes. We have used Pb as the superconducting and Co or Ni as the ferromagnetic components. Structural characterizations done with X-ray diffraction and Transmission Electron Microscope demonstrated that Pb and Co segments are good single crystal whereas Ni segments are polycrystalline. We have done electrical transport measurements on arrays of multilayer nanowires (embedded inside the template) showing interesting magnetoresistance behaviors below the superconducting transition temperature of Pb. Four terminal electrical measurements on a single multilayer nanowire are in progress.

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