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Bismuth nanowire array fabrication and measurements[1] RICHARD GRECO, Los Alamos National Laboratory — Bismuth Nanowire Arrays (BNAs) are semiconducting materials that can potentially lead to radiation detectors with better spectral resolution and efficiency than cooled high purity germanium because of the high atomic number of bismuth and expected nanowire electronic properties. Bismuth, which is normally a semi-metal, becomes a semiconductor when it is fabricated in wire form with a diameter smaller than 50 nanometers (nm). Arrays of bismuth nanowires are produced by vapor deposition into electrochemically-fabricated alumina templates. The electronic bandgap of a bismuth wire is a function of its diameter, varying from 0 eV at 50 nm to 0.7 eV at 5 nm. In this paper we present an improved fabrication technique and recent measurements on BNAs.

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