

Abstract Submitted
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Magneto-Transport in Polyaniline Nanofiber Network¹ K. DENIZ DUMAN, N.-R. CHIOU, V.N. PRIGODIN, Dept. of Physics, The Ohio State University, Columbus, Ohio, A.J. EPSTEIN, Dept. of Physics, Dept. of Chemistry, The Ohio State University, Columbus, Ohio — We report large magnetoresistance (up to 12% at 8 T and 3 K) for polyaniline nanofiber network composed of nanofibers with an average diameter of about 80 nm. The polyaniline nanofiber networks were synthesized via chemical oxidative polymerization [1] and were studied at low and high electric and magnetic fields for temperatures 2 K- 250 K for their magneto-transport behavior. A transition from positive MR (temperatures 75 K and below) to negative MR (temperatures 100K and above) is observed. The MR may be explained by possible competing mechanisms; shrinkage of the hopping wavefunction and quantum interference effect in the applied magnetic field. It is also noted that applied electric field affects MR. In the positive MR regime an increase in MR is observed as the applied electric field decreases. Detailed results of various polyaniline nanofiber samples and possible mechanisms responsible for the magneto-transport behavior will be discussed.

[1] N.-R Chiu, A. J. Epstein, *Adv. Mater.* **17**, 1679 (2005).

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K. Deniz Duman
Dept. of Physics, The Ohio State University, Columbus, Ohio

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