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Low Temperature Probe for Measuring Anisotropic Magnetotransport[1] GALIN DRAGIEV, DANIEL GRANT, AMLAN BISWAS, Department of Physics, University of Florida, Gainesville, FL 32611
— Certain materials display a change in resistance when a magnetic field is applied on them. This resistance change is called magnetoresistance (MR). The value of MR may also depend on the direction of the magnetic field relative to the crystal structure of the material, which is called anisotropic MR (AMR). We built a probe which allows us to measure the AMR of a sample in a temperature range of 1.2 K to 300K in magnetic fields of up to 9 tesla. The probe design allows the angle between the magnetic field and a particular direction of the sample to be changed over almost the entire solid angle of 4π. In particular, this probe lets us measure the AMR of a sample with magnetic anisotropy when the magnetic field is applied either along the hard or easy axes, or somewhere in between. The probe allows us to change the orientation of the sample while it is inside the low temperature cryostat. We will present our data on hole-doped manganese oxide (manganite) thin films and discuss the possible origins of AMR in these materials.

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