

Magnetic field sensors from polycrystalline manganites

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We report on the fabrication of magnetic sensors based on bulk $\text{La}_{0.67}\text{Sr}_{0.33}\text{MnO}_3$ and $\text{La}_{0.67}\text{Ba}_{0.33}\text{MnO}_3$ material. The sensors were characterized at fields of 0–8 T and temperatures of 4.2–300 K. The sensors display a maximum sensitivity of $\sim 200\%/T$ at room temperature within a field range of 1–3 mT. For the sensor geometry investigated here, the low-field magnetoresistance (MR) of the sensors measured in three field orientations with respect to the sensor plane is strongly anisotropic. The high-field MR, in contrast, is found to be field-orientation independent. Periodic response of the sensor's resistance to the angle between the field and sensor-plane is demonstrated at room temperature.