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Magnetoresistance in ordered perovskite $\text{Ba}_2\text{FeMoO}_6$

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Room temperature magnetoresistance(MR) effect has been observed for polycrystalline double perovskite $\text{Ba}_2\text{FeMoO}_6$ (BFMO), which has been prepared by solid-state reaction in a stream of 5% H_2/Ar . The fact that superlattice lines are observed in the x-ray diffraction pattern for BFMO would suggest the high degree of ordering of Fe and Mo in the perovskite lattice of BFMO. The temperature dependence of resistivity shows metallic behavior below the ferromagnetic transition temperature of 317K. BFMO exhibits a sharp low-field MR at room temperature. The magnitude of negative MR with the magnetic field of 0.8T at 12 and 300K is as large as 27 and 5%, respectively. The observed MR features do not show any hysteresis behavior related with ferromagnetic properties. A quantitative analysis of the observed MR in the samples is attempted through the correlation between MR and field dependent magnetization. The MR feature in BFMO is explained by spin-polarized tunneling between grains.

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