

Abstract Submitted
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Multiferroic thin films WILMA EERENSTEIN, NEIL MATHUR, Dept. of Materials Science, University of Cambridge, FINLAY MORRISON, JIM SCOTT, Dept. of Earth Sciences, University of Cambridge — Multiferroic materials are both ferroelectric and ferromagnetic. This combination opens up new applications, as the magnetization can be addressed with an electric field and the polarization by a magnetic field. However, most multiferroic materials either have low polarizations and/or low transition temperatures, thus limiting their potential use in novel devices. We report on high quality epitaxial films of two candidate materials, namely BiFeO₃ and BiMnO₃. Both films have narrow X-ray rocking curves of around 0.04 ° and are highly insulating with resistivities in excess of 10⁹ Ohm cm. The BiMnO₃ films are ferromagnetic (2.2 μ_B/Mn) and the BiFeO₃ films show a very weak ferromagnetic magnetization of <0.05 μ_B/Fe, in contrast to recent claims of an epitaxial enhancement to 1 μ_B/Fe (Wang *et al.*, Science **299**, 1719 (2003)). In BiFeO₃ films we record a dielectric constant of 80 at room temperature. Interestingly, this figure is 2500 for BiMnO₃ suggesting good ferroelectric properties.

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