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| Title | Fabrication and Ferromagnetic resonance study of BZT-BCT/LSMO heterostructure films on LAO and Pt | | |
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| Abstract |  |
| In this article, dynamic magnetic properties of La0.7Sr0.3MnO3 (LSMO) thin film capped with a Pb-free ferroelectric BZT-BCT layer deposited on two different substrates, i.e. lanthanum aluminate (LAO) and Platinum (Pt), by pulsed laser deposition (PLD) have been investigated using ferromagnetic resonance (FMR) spectroscopy. The heterostructures of BZT-BCT/LSMO on LAO substrate were highly (0 0 l)-oriented whereas these were randomly oriented on Pt substrate. The well-behaved M-H hysteresis loops were observed at room temperature for both heterostructures indicating the ferromagnetic behavior of LSMO. The right shift of the hysteresis loop of the heterostructure was observed due to the magnetoelectric coupling between ferroelectric and ferromagnetic layers. The FMR measurements yield optimum values of different important parameters such as the linewidth offset, Gilbert damping, gyromagnetic ratio, and in-plane uniaxial anisotropy field of the thin films, which are essential to design spin valve and magnetic tunneling based devices. We found the lowest Gilbert damping parameter of ∼0.03 for the BZT-BCT/LSMO/LAO heterostructure due to spin orbit coupling. In addition, the gyromagnetic ratio was also obtained to be small (0.002 GHz/Oe) in the same film. These results open new possibilities to use BZT-BCT/LSMO heterostructure for future spintronic device applications. | |