Electronic Supplementary Information

Multiferroic properties and magnetoelectric coupling in Fe/Co co-doped $Bi_{3.25}La_{0.75}Ti_3O_{12}$ ceramics

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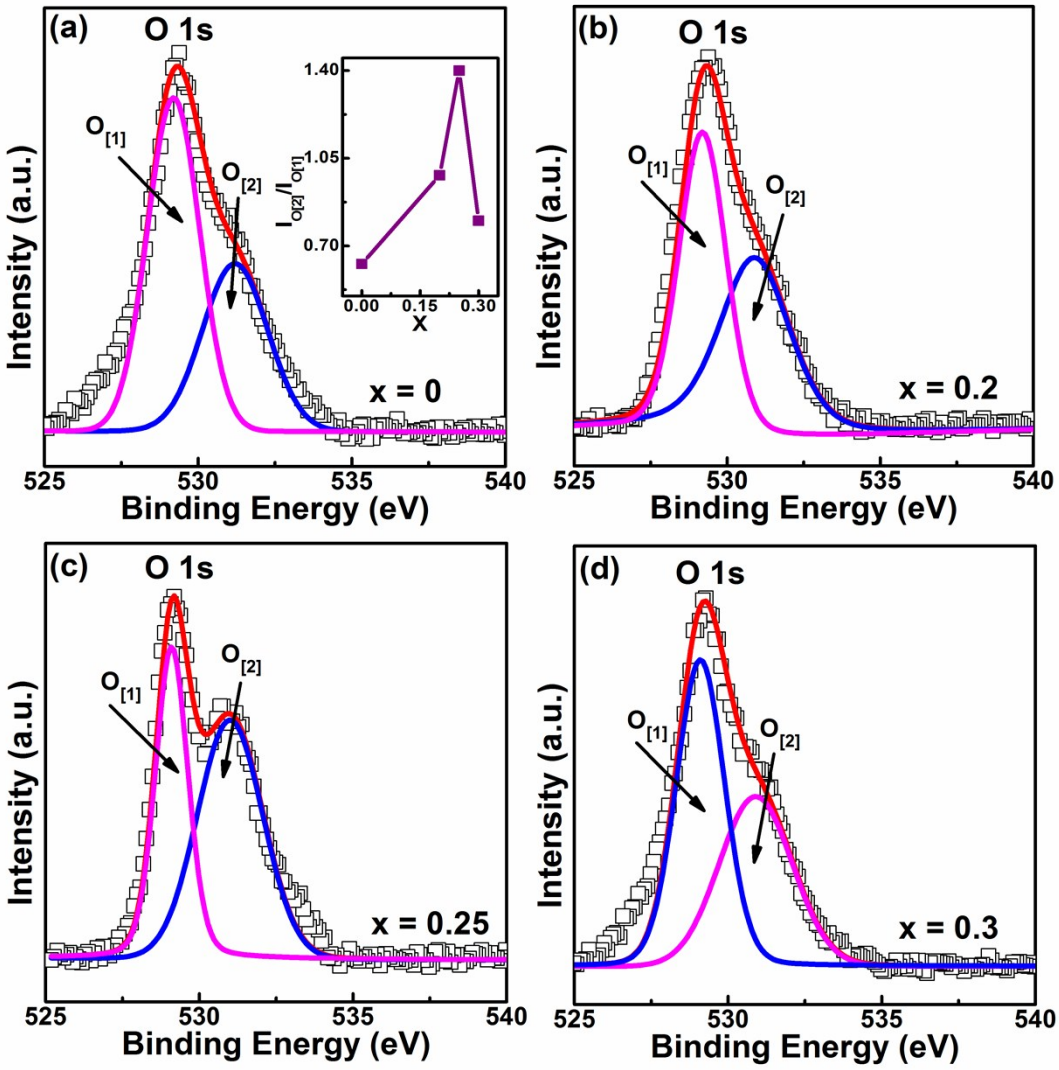

Fig. S1 O 1s spectra (hollow squares) and their Lorentzian-Gaussian dividing results (solid lines) for the samples with x = 0, 0.2, 0.25 and 0.3. Inset shows x dependent $I_{O[2]}/I_{O[1]}$.

The x-ray photoelectron spectroscopy (XPS) were measured by Thermal Scientific using Al Kα. As shown in Fig. S1, O 1s spectra can be fitted into two peaks. The fitted peak with lower binding energy of about 529.2 eV, denoted by $O_{[1]}$, represents the oxygen in the lattice, while the other one at about 531.2 eV, denoted by $O_{[2]}$, is assigned to absorbed oxygen species, relating to the presence of oxygen vacancies (Huang et al., *Appl. Phys. Lett.*, 2014, 105, 022904). The relative amount of oxygen vacancies can be estimated by $I_{O[2]}/I_{O[1]}$ (I_O represents the area of the corresponding peak).

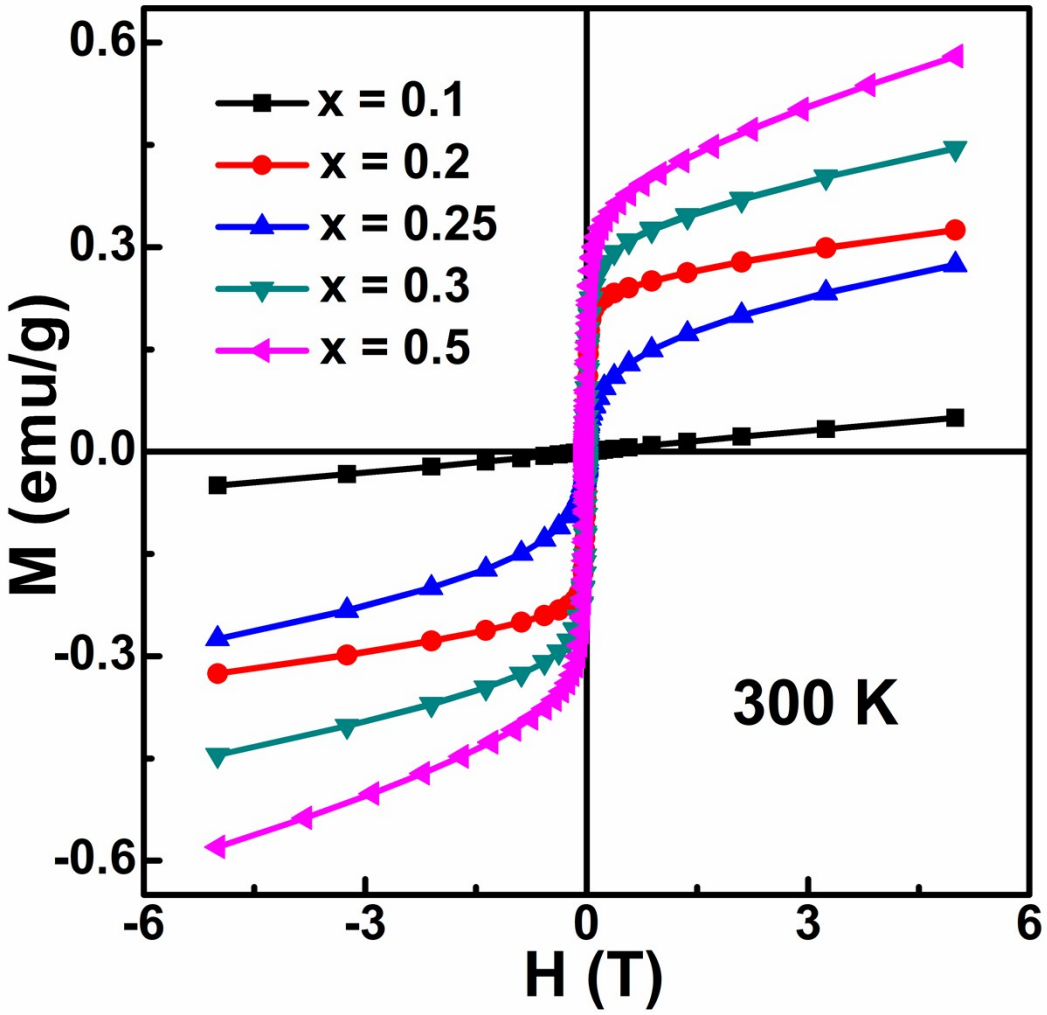

Fig. S2 Magnetic Hysteresis (*M-H*) loops of the BLTFC ($x \neq 0$) ceramics measured at room temperature.

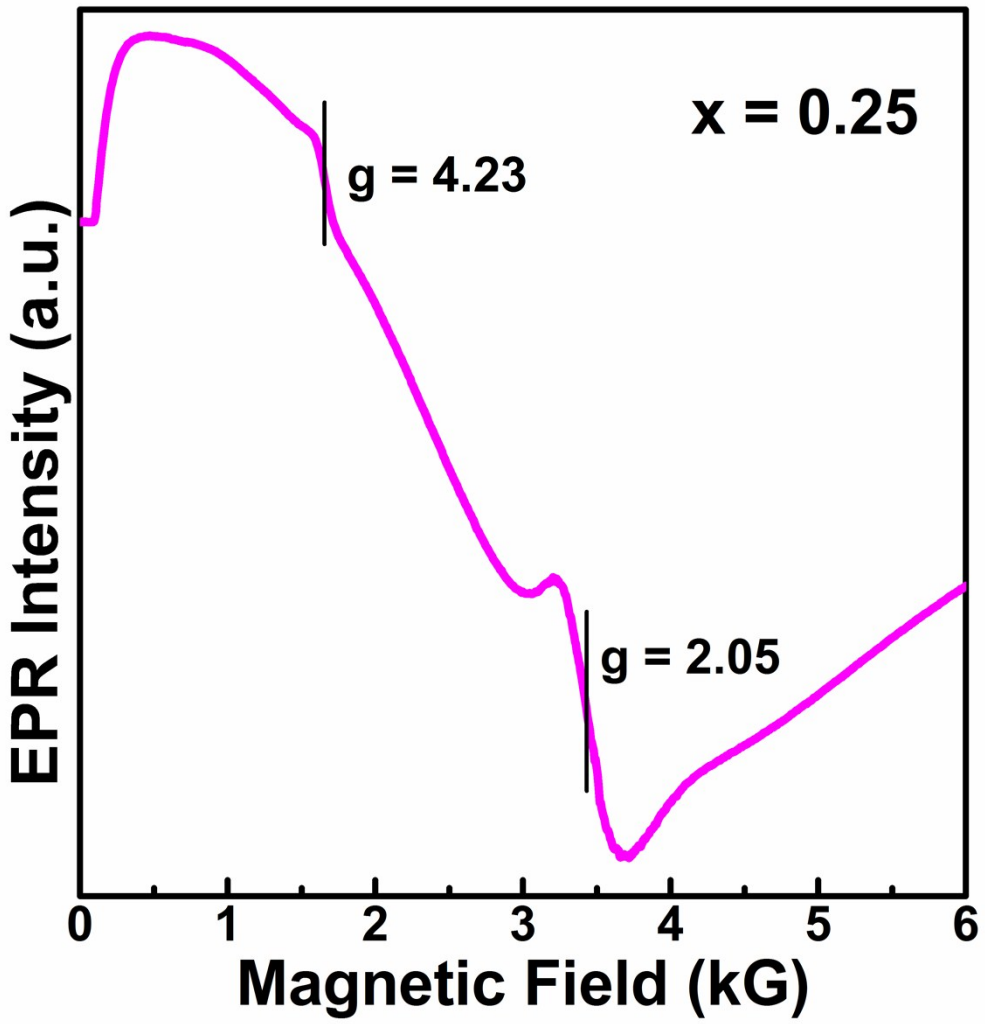

Fig. S3 EPR spectrum performed on an x-band Bruker EMX plus 10/12 cm spectrometer operating at 9.85 GHz for the x = 0.25 sample at room temperature.

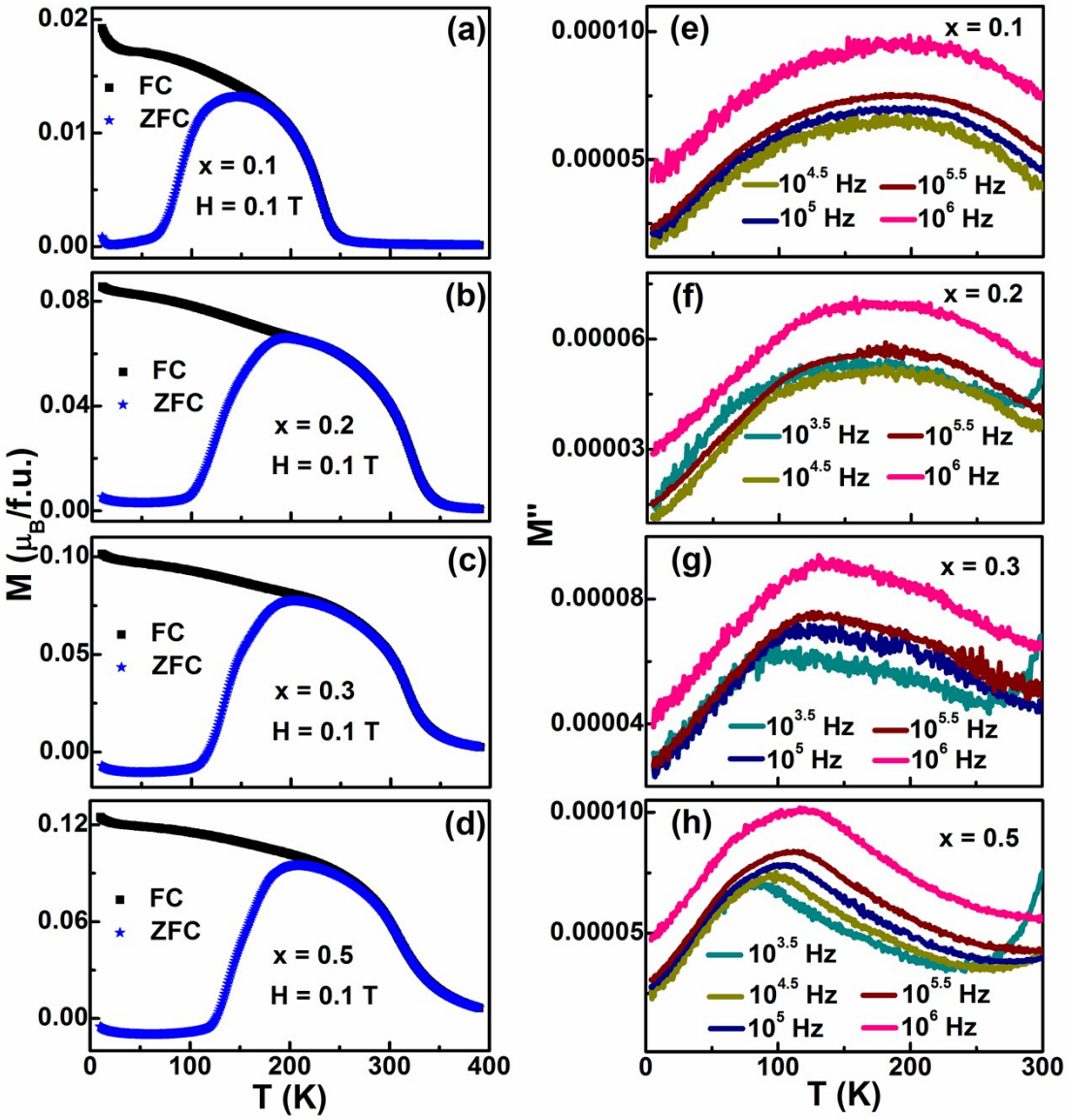

Fig. S4 (a)-(d) Magnetization as a function of temperature measured under ZFC and 0.1 T FC conditions for the samples with x = 0.1, 0.2, 0.3, and 0.5, respectively. (e)-(h) Temperature dependent imaginary part (M") of dielectric modulus for the corresponding samples at various frequencies.