Supplementary *Information*
Ma. Oumezzine et al. "Structural, Magnetic and Magnetocaloric effect in Epitaxial $La_{0.67}Ba_{0.33}Ti_{0.02}Mn_{0.98}O_3$ Ferromagnetic thin films grown on 001-oriented $SrTiO_3$ substrates"

Supplementary Information

Structural, Magnetic and Magnetocaloric effect in Epitaxial $La_{0.67}Ba_{0.33}Ti_{0.02}Mn_{0.98}O_3$ Ferromagnetic thin films grown on 001-oriented $SrTiO_3$ substrates

Marwène Oumezzine[1,*], [1]Aurelian Catalin Galca[2,*], [2]Iuliana Pasuk[2], Cristina Florentina Chirila[2], Aurel Leca[3], Victor Kuncser[3], Liviu Cristian Tanase[4,6], Andrei Kuncser[5,6], Corneliu Ghica[5] and Mohamed Oumezzine[1]

[1]Laboratoire de Physico-chimie des Matériaux, Université de Monastir, Monastir, Tunisia.
[2]Laboratory of Multifunctional Materials and Structures, National Institute of Materials Physics, Magurele, Romania
[3] Laboratory of Magnetism and Superconductivity, National Institute of Materials Physics, Magurele, Romania
[4] Laboratory of Nanoscale Condensed Matter, National Institute of Materials Physics, Magurele, Romania
[5] Laboratory of Atomic Structures and Defects in Advanced Materials, National Institute of Materials Physics, Magurele, Romania
[6] Faculty of Physics, University of Bucharest, Magurele, Romania

[1] # Authors to whom any correspondence should be addressed.
e-mail: oumezzine@hotmail.co.uk
[2] e-mail: ac_galca@infim.ro

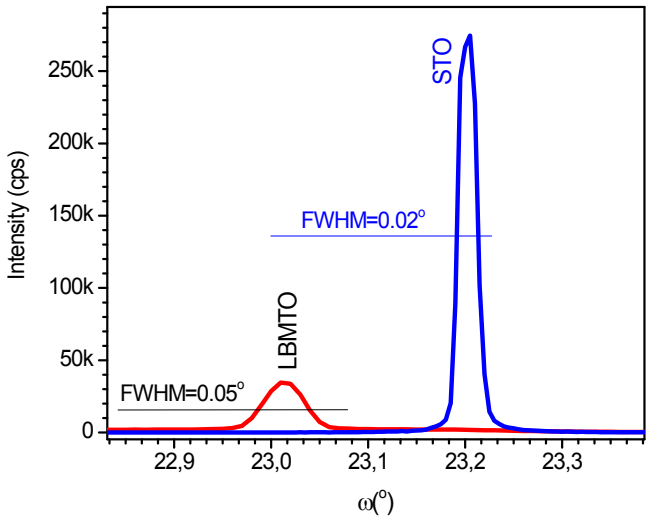

Fig.S1. The ω rocking curves for the 002 peaks of LBTMO and STO. The full widths at half maximum of STO 002 peak and LBTMO 002 peak are about 0.020° and 0.050°, respectively, showing a satisfactory structural order in the perpendicular direction.

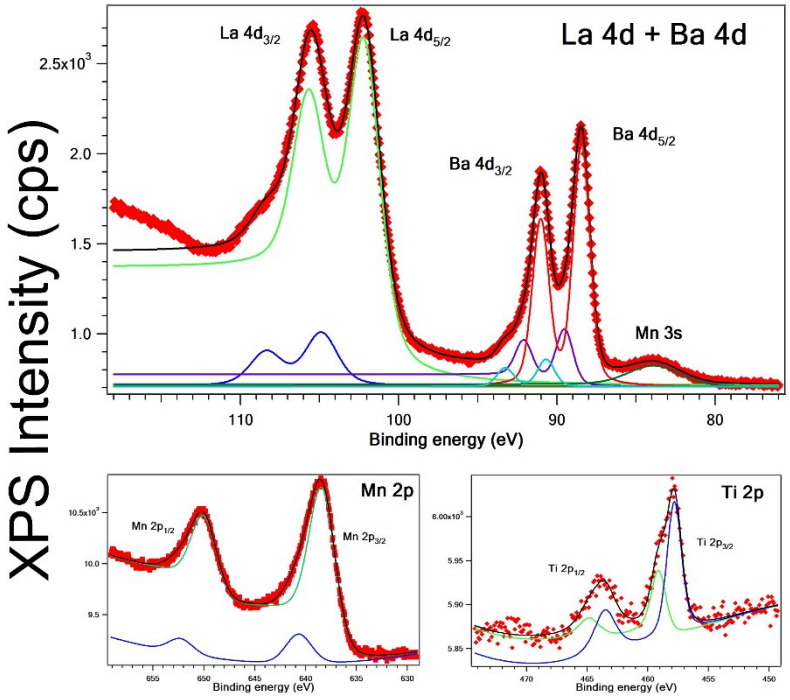

Fig S2. Selected La 4d, Ba 4d, Mn 2p and Ti 2p electron distribution curves for LBTMO surface, together with deconvolutions using Voigt profiles. The following 2 components were not taken into account for chemical composition analysis: i) the higher binding energy component in the spectra of La 4d which can be assigned to a shake-up satellite, often exhibited by the rare earth elements; ii) the lower binding energy component of Ti 2p given by the electrons originating from the most probably TiO_x terminated surface. The lowest binding energy component is assigned to Mn^{3+}, and the highest to Mn^{4+}.

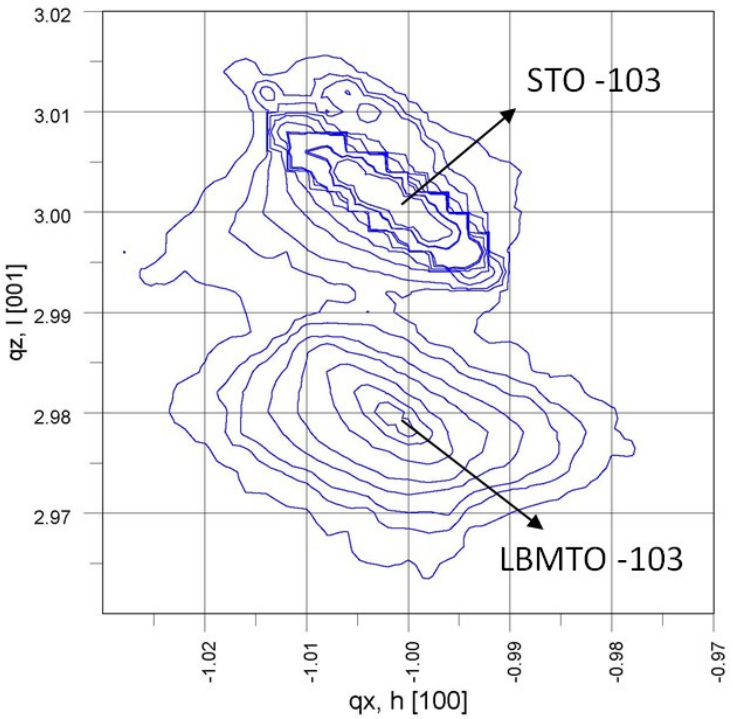

Fig S3. Reciprocal space mapping around the -103 node proving that the in-plane constant lattice of LBTMO thin film is identical with the one of the STO substrate.