

Local Bias Induced Ferroelectricity in Manganites With Competing Charge and Orbital Order States - Supplementary Info

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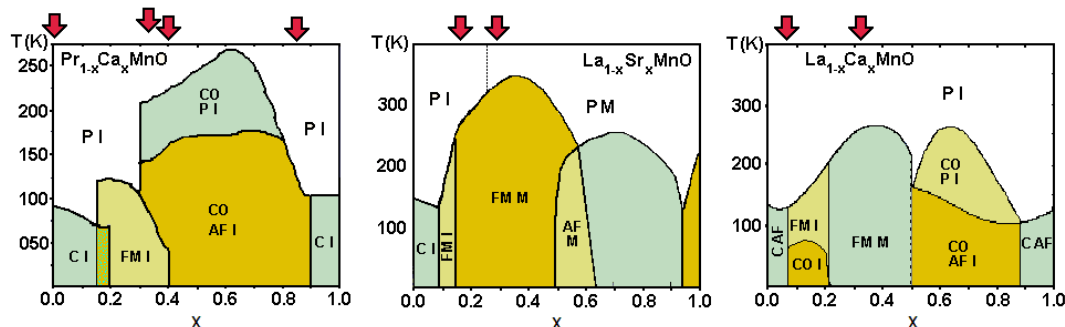


Fig. 0: Phase diagrams as function of doping (x) and temperature for Manganites: $\text{Pr}_{1-x}\text{Ca}_x\text{MnO}_3$ [4] (left) $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ [14] (center) and $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$ [3] (right), showing samples composition positioning (top arrows). Acronyms: P paramagnetic, AF antiferromagnetic, FM ferromagnetic, M metallic, I insulator, CO charge order, C spin canted arrangements.

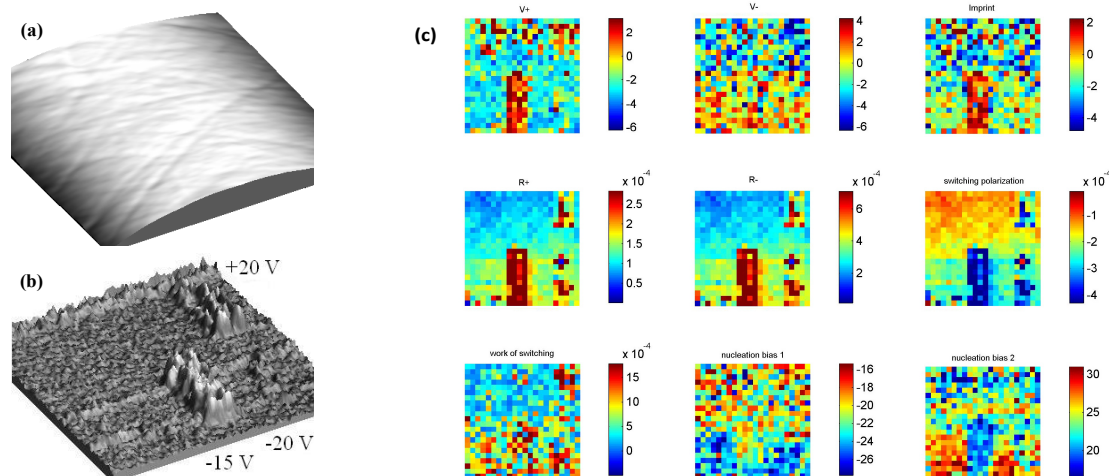


Fig. 3: Topographic (a) and piezo contrast (b) scans of $3 \times 3 \mu\text{m}^2$ surface after performing bias lithographic paths; detail of the respective BEPS maps results (c) for the single crystal $\text{Pr}_{0.60}\text{Ca}_{0.40}\text{MnO}_3$ sample.

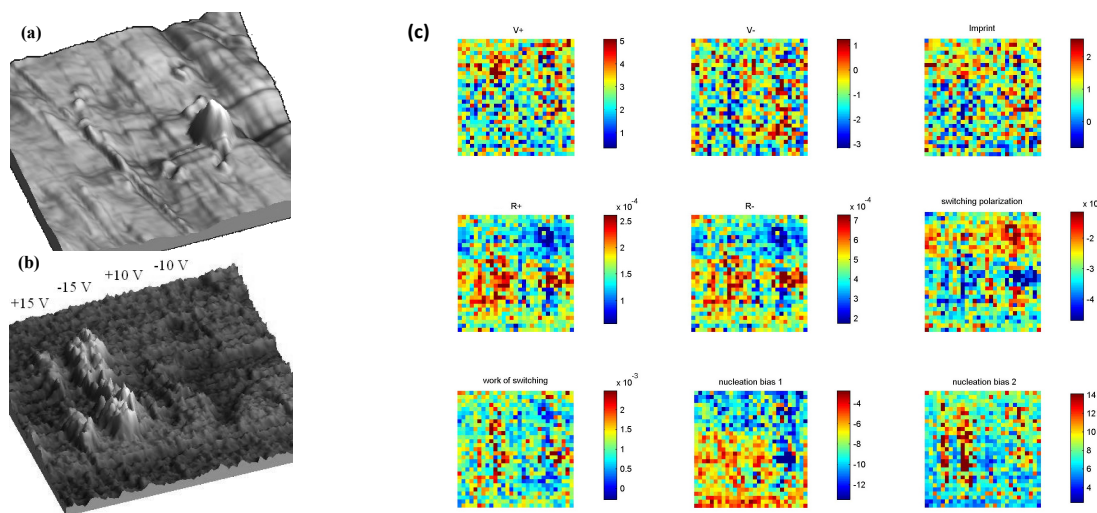


Fig. 4: Topographic (a) and piezo contrast (b) scans of $3 \times 3 \mu\text{m}^2$ surface after performing bias lithographic paths; detail of the respective BEPS maps results (c) for the single crystal $\text{La}_{0.89}\text{Sr}_{0.11}\text{MnO}_3$ sample.