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[613] Oxygen-vacancy engineering in strained multiferroic SrMnO₃ thin films

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The control of the oxygen vacancies content in magnetoelectric oxides opens new routes to induce unexpected properties in strained thin films. Here we show experimental evidence for the increase of the oxygen-vacancy content upon increasing tensile epitaxial strain in multiferroic SrMnO₃ thin films. Furthermore, a novel dependence of the oxygen stoichiometry on the film thickness has been found, allowing us to control the concentration of these defects by both the applied strain and film thickness. We analyze the effect of the oxygen-vacancy content on the ferroic properties of strained SrMnO₃ films focusing on the generation of a flexoelectric component that rotates the in-plane <110> ferroelectric polarization.

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