

Abstract Submitted
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Thermoelectric properties of electron-doped SrTiO₃ thin films
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Compostela, CONDENSE MATTER CHEMISTRY GROUP TEAM — Two dimen-
sional conductors are expected to show an improved thermoelectric performance due
the positive effect of quantum confinement on the thermoelectric power, and the de-
crease of thermal conductivity by interface boundary scattering. The recent report
of a large increase of the thermoelectric power in quantum wells of Nb-doped SrTiO₃
(STO) seems to be in agreement with this hypothesis. However, extrinsic effects like
the existence of oxygen vacancies that propagate away from the interface cannot
be ruled out, and the results are far from clear. Here we will show the thermo-
electric properties (electrical conductivity, Seebeck coefficient, and Hall effect), of
epitaxial thin-films of (La,Nb)-doped STO. The films have been deposited by PLD
on different substrates (STO, LAO...) to study the effect of tensile/compressive
stress on the thermoelectric properties of the system. The oxygen pressure during
the deposition was carefully controlled to tune the amount of oxygen vacancies and
to compare with the cation doping. We have performed a systematic study of the
transport properties as a function of thickness and doping, which along with the
effect of stress, allows to understand the effect of charge density and dimensionality
in an oxide system with promising thermoelectric properties. [1] H. Ohta et al. Nat.
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