

**Manipulation of inhomogeneous polar textures
in ferroelectric perovskites and related nanostructures**

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During the last few years, a plethora of unexpected topological polar textures (skyrmions, merons, vortices, ...) and related exotic phases have been reported in ferroelectric materials and nanostructures, opening a totally new field of investigations [1]. The interest for those polar textures is not only academic since they are often accompanied by unusual properties such as negative capacitance, chirality or can exhibit a particle-like behaviour, as relevant for a wide variety of potential applications. Although many advances have been reported recently, the practical generation and manipulation of such polar textures remains nowadays very limited. Here, relying on first- and second-principles theoretical methods [2], we propose to achieve dynamical control of inhomogeneous polar textures from acoustic [3] or electric pulses [4] and report unexpected results in conventional ferroelectrics like BaTiO₃ and PbTiO₃. Going further, we also consider the motion of such inhomogeneous polar textures [5] and discuss how they could possibly be linked to extra electrical charges, envisioning an interplay and coupled dynamics.

References:

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