Manipulation of perovskite dielectrics with high electric fields and large strains

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- High electric fields can produce large piezoelectric or electrostrictive strains
- Transient changes in crystallographic symmetry or in structural distortion
- Larger responses near phase transitions: enhanced materials for devices
- In situ structural probes based on synchrotron x-ray diffraction

Transient electric-field-driven transitions in BiFeO₃

Octahedral Rotations in BaTiO₃/CaTiO₃ Superlattices

- O octahedral rotation modified by applied fields
- Compare with DFT predictions


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- Large piezoelectric strain in BiFeO₃
- Nonlinear at high electric fields due to proximity of R-T transition