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**Antiferroelectricity in lead zirconate**

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Antiferroelectrics are essential ingredients for widely applied piezoelectric and ferroelectric materials. Despite their technological importance, the reason why materials become antiferroelectric has remained allusive since their first discovery. Experimentally, antiferroelectrics can be recognized as materials that exhibit a structural phase transition between two non-polar phases with a strong dielectric anomaly at the high temperature side of the transition. Despite a widely spread opinion that these materials can be viewed as direct analogues of antiferromagnetics, the so-called anti-polar ionic displacements at the transition do not guaranty the antiferroelectric behavior of the material while the interpretation of such behavior does not require the incorporation of the anti-polar ionic displacements in the scenario. To get insight in the true origin of antiferroelectricity, we studied the lattice dynamics of the antiferroelectric lead zirconate using inelastic and diffuse X-ray scattering techniques and the Brillouin light scattering. Based on our experimental data, we showed that the driving force for antiferroelectricity is a ferroelectric instability. Through flexoelectric coupling, it drives the system to a state, which is virtually unstable against incommensurate modulations. However, the Umklapp interaction allows the system to go directly to the commensurate lock-in phase, leaving the incommensurate phase as a "missed" opportunity. By this mechanism the ferroelectric softening is transformed into an antiferroelectric transition. The remaining key parts of the whole scenario are repulsive and attractive biquadratic couplings that suppress the appearance of the spontaneous polarization and induce the anti-phase octahedral rotations in the low-temperature phase. The analysis of the results reveals that the antiferroelectric state is a "missed" incommensurate phase, and that the paraelectric to antiferroelectric phase transition is driven by the softening of a single lattice mode via the flexoelectric coupling. These findings resolve the mystery of the origin of antiferroelectricity in lead zirconate and suggest an approach to the treatment of complex phase transitions in ferroics.