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**The phase diagram of $Sr_{1-x}Eu_xTiO_3$: Crossover from displacive to order-disorder dynamics** ZURAB GUGUCHIA[1], HUGO KELLER[2], Physik Institut der Universität Zürich, ALEXANDER SHENGELAYA[3], Department of Physics, Tbilisi State University, JÜRGEN KÖHLER[4], ANNETTE BUSSMANN-HOLDER[5], Max-Planck-Institut für Festkörperforschung — The phase diagram of $Sr_{1-x}Eu_xTiO_3$ is determined experimentally by EPR and resistivity measurements and analyzed theoretically in terms of the self-consistent phonon approximation (SPA) as a function of x ($0.0 \leq x \leq 1.0$). It is observed that the oxygen octahedral tilting instability temperature $T_S$ increases nonlinearly with x. The theoretical analysis demonstrates that a crossover from displacive to order-disorder dynamics takes place for $x \geq 0.25$, signaled by a change in the local double-well potential and the soft mode temperature dependence.

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