

MAGNETIC AND ELECTRICAL ORDERING
OF DIELECTRICS WITHIN THE THEORY
OF IONIC AND COVALENT BONDS

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S u m m a r y

The competition of hetero- and homopolar (covalent) bonds and their fluctuations (CBF) is considered as a basis of ferromagnetic ((FM) or antiferromagnetic (AFM)) and ferroelectric (FE) ordering. The exchange integrals of FM and (AFM) signs are calculated in the multielectronic operator spinors (MEOS) representation (for the Heisenberg model). Local FE deformations (ξ) create electrical polarization $P(\xi)$. The singularities of CBF spectra in the FE phase destabilize it and define $T_c(\hat{\gamma})$. The electroelastic coefficients $\hat{\gamma}$ are the combinations of ionic charges inhomogeneities and bond energies. FE phase diagrams and the types of transitions differ for different values of $\hat{\gamma}$.