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Phase transition via intermediate state and control of piezoelectric parameters in lead-zirconate-titanate based solid solutions[1] V. SOBOLEV, South Dakota School of Mines & Technology, V. ISHCHUK, Institute for Single Crystals, NAS of Ukraine, 61001 Kharkov, Ukraine, N. SPIRIDONOV, STC "Reaktivelektron", NAS of Ukraine, 83096 Donetsk, Ukraine — Presentation contains results of experimental investigation of the influence of external electric field on the stability of phases in antiferroelectric substances with a small difference in the free energies of the ferroelectric and antiferroelectric states. The composition-electric-field phase diagrams with intermediate states of coexisting domains of the ferroelectric and antiferroelectric phases are obtained for lanthanum-modified lead-zirconate-titanate solid solutions. This intermediate state appears in the process of inducing of the ferroelectric state by an external electric field in antiferroelectric solid solutions. Peculiarities of the intermediate state caused by interphase interactions between coexisting ferroelectric and antiferroelectric domains are revealed. Analysis of the dependences of piezoelectric material parameters on external electric field at the phase transition via an intermediate state has been performed. It is demonstrated that within the interval of existence of the intermediate state the piezoelectric material parameters can be effectively controlled by an applied electric field.

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