Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Dramatic effect of the near-electrode layer configurations on the phase transition characteristics of ferroelectric-paraelectric superstructures[1] BURC MISIRLIOGLU, Asst. Prof., ARKADI LEVANYUK, Professor (Retired) — Ferroelectric-paraelectric superstructures have attracted great interest. A few experimental reports have emphasized the effect of individual layer thickness on the transition temperature of these systems. Here, we theoretically show that the phase transition characteristics of these systems are very sensitive to the structural configuration near the electrodes. The phase transition is homogeneous in the system only if the layers contacting the electrodes are paraelectric layers of 1/2 thickness of other individual layers. If the ferroelectric layer contacts the electrode (and the other.electrode is contacted by a paraelectric layer) the phase transition temperature is higher than in the previous structure and the spatial distribution of the polarization at the phase transition is inhomogeneous being maximal near the electrode and disappearing far from it. A striking result is that the transition temperature in one unit bilayer is the same as a system consisting of any number of bilayers. Moreover, the profile of the polarization is unchanged upon addition of new bilayer units to the system. We also discuss general features of the domain structures below the phase transition temperature and transition anomalies.

[1]APL has been partially supported by the Scientific and Technological Research Council of Turkey (TUBITAK) BIDEB Program and by the Ministry of Science and Education of Russian Federation (State Contract # 02.740.11.5156). IBM acknowledges TUBA GEBIP.

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Date submitted: 13 Nov 2011 Electronic form version 1.4