

ON THE PROBLEM OF POLARIZATION AND CHARGES WITHIN DOMAIN WALLS IN DIELECTRICS

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Domain walls (DWs) in crystalline dielectric materials are two-dimensional objects arising as due to structural phase transition(s), and are closely related to the symmetry change taking place in the system.

In the present paper, we recall the approach of DWs in terms of symmetry breaking, and illustrate in some examples how the tensorial properties – and structure of DWs may differ from those of the bulk material.

Particular interesting features are the polarization spatial variation within DWs, and the electrical charges carried by them. We shall review how a Landau-Ginzburg approach and the theory of symmetry can allow to reply to these questions, illustrating the approach by chosen school examples of ferroic materials.

The approach of DWs in terms of symmetry was developed by V. Janovec et al in several papers after the initial basic work published as early as 1976 ^[1, 2, 3, 4].

References :

- [1] V. Janovec, *Ferroelectrics*, **12**, 43 (1976)
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- [4] V. Janovec and J. Přivratská, *Domain structures*, in *International Tables for Crystallography*, Vol. D, ed. A. Authier, Kluwer Academic, Dordrecht, 2003 and references therein