

Modeling of the ferroelectric hysteresis as variational inequality

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Ferroelectric materials are characterized by interaction-effects of mechanical and electrical fields due to different polarization directions of the unit cells. The relations between polarisation and electrical field and mechanical strain and electrical field respectively can be described by hysteresis curves. Some models, which describe the ferroelectrical material behaviour, e.g. [2, 4], rely on concepts closed to elastoplasticity. We use these ideas and derive variational evolution inequalities analogously to elastoplasticity, see [1]. Based on these inequalities we formulate equivalent mathematical problems and get some existence results, see [3]. We think that the formulation of variational evolution inequalities is a good starting point for numerical methods similar to elastoplasticity.

References

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