

LOCAL ELECTROMECHANICAL RESPONSE OF IONIC SEMICONDUCTOR THIN FILMS

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S u m m a r y

We report on the calculations of a local electromechanical response of ionic semiconductor thin films induced by local changes of the concentration of ions (*stoichiometric contribution*) and free electrons and holes (*electron-phonon interaction via the deformation potential*). Dynamic strain-voltage hysteresis loops are obtained for an ionic semiconductor thin film with mobile acceptors (donors) and holes (electrons).

In case of ion-blocking electrodes, changes in the hole (electron) concentration make a dominant contribution to the dependence of the mechanical displacement of the film surface on the voltage applied to the probe, which is directly registered by scanning probe microscopy (SPM) methods. Thus, the displacement of the ionic semiconductor surface can provide an important information on local changes of the charge state of acceptors (donors) and electron-phonon correlations via the deformation potential.