

SOUND VIBRATIONS IN IONIC
CRYSTAL TAKING ELECTRIC FIELD
CORRELATIONS INTO ACCOUNT

A.A. Stupka

Oles Honchar Dnipropetrovsk National University
(72, Gagarin Ave., Dnipropetrovsk 49050, Ukraine;
e-mail: antonstupka@mail.ru)

S u m m a r y

Small vibrations in a solid insulator in the presence of a self-consistent electric field with the first strength moment at the equilibrium equal to zero and the second one different from zero have been considered. A new variable, the second moment of electric field strength, was introduced into the Euler equation, and a temporal equation for this variable was derived on the basis of Maxwell equations in the hydrodynamic approximation. A wave equation was obtained, and its solutions – two transverse and one longitudinal sound vibration branches – are found. The transverse sound velocity is calculated; the results obtained correspond to those calculated using the shear modulus to an accuracy of about 10%.