ACOUSTICS2008/1330
The peculiarities of energy characteristics of acoustic waves

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Acoustic waves propagating in piezocrystals transport kinetic and potential energies. Potential energy consists of mechanical, electrical and mutual contributions. At that the change in potential energy of the voluentary unit of medium is identified with the work of mechanical stress for infinitesimal displacement. Versus method of integrating this equation there are two different expressions for density of potential energy. In case 1 (traditional approach) the density of energy is equal to the half-product of mechanical stress and strain. At that for any type of plane acoustic wave the instantaneous density of total energy in given point of medium depends on time and there is no mutual transformation of potential and kinetic energies. For this case there exists well-known traditional expression for power flow. In case 2 suggested by authors the density of potential energy is equal to half-product of mechanical stress gradient and displacement. At that the density of total energy does not depend on time. It means the mutual transformation of potential and kinetic energies according to motion equation. The new expression for power flow is derived for this case. The peculiarities of energy characteristics for piezoactive waves are discussed. The work is supported by RFBR grant N°08-08-00793.