

SELF-CONTAINED SOURCES OF ACOUSTIC WAVES USING HIGH-ENERGY MATERIALS OSCILLATORY BURNING MODES

G.Sakovich, A.Vorozhtsov, B.Vorozhtsov, S.Bondarchuk, V.Arhipov

(IPChET, SB RAS, Altai region, Byisk)

At the influence of acoustic waves with parameters exceeding threshold values on frequency and vibration amplitudes on alive organisms, the high-power psychological and physiological effect causing to non-lethal defeat is possible. One from perspective ways of high-power acoustic waves with specific parameters generation is the use of high-energy materials energy at unstable burning modes in specially constructed acoustic gas generators. In the paper the results of preliminary researches of pulsating modes of working solid propellant gas generator for creation of directed acoustic impulses of infra-low, low and medium acoustic frequencies formed by the nozzle unit and a resonator are submitted. The parameters of relaxational oscillations are determined by acoustic properties of the combustion chamber and presence in it of heat-storage elements. The given effects can be assume as a basis of new self-contained NLW systems creation.

For the theoretical analysis of of unstable burning parameters and characteristics of relaxational oscillations in the gas generator of acoustic waves the mathematical models based on consideration of the solid propellant gas generator as of the power reactor of ideal mixing, and also algorithms of stability threshold of oscillations calculation in the given systems are developed. The problems concerning the requirements to a source of acoustic waves and parameters of oscillations are considered; the probable schematics for various generators of acoustic waves on the basis of the combustion chamber, nozzle unit and resonator are shown; the selection of propellant compositions and geometries of a charge is considered.