

## **Autonomus acoustic solid propellant gas generators.**

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For the present time one from perspective directions developed NLW is the acoustic weapon. At action of acoustic waves with parameters exceeding a defined values on frequency and oscillation frequency on alive organisms, the high-power psychological and physiological effect resulting in to non-lethal defeat is possible. One from perspective ways of generation of high-power acoustic waves with specific parameters is the use of energy of jets of solid propellant gas generator (SPGG) combustion products. With all this going on it is important that SPGG should work in oscillatory combustion regimes.

In the paper the results of theoretical research of use of pulsating operational modes of SPGG for generation of directed acoustic impulses infralow, low and medium frequencies formed by nozzle unit, being simultaneously and resonator, are submitted. The parameters of oscillations of pressure amplitude are determined by acoustic properties of the combustion chamber and availability in it some devices adjusting a level of combustion products enthalpy (for example, various destabilizers of steady burning, heat-accumulated elements etc.). This principles can be lay the foundation of creation of new autonomous NLW systems, distinguished by compactness, mobility and high sound directional power.

On the basis of conservation laws of a mechanics the mathematical models circumscribing parameters of oscillatory combustion regimes and change of the characteristics of relaxational oscillations in the gas generator, flow in the nozzle (resonator) and propagation of a jet of combustion products in an environment are developed.

The selection of propellant formulations and geometries of a charge, design of SPGG as combination of the combustion chamber, nozzle unit and resonator are considered. The results of calculations of changes of parameters of sound pressure on various distances from the gas generator - source are submitted, the analysis of influence of a geometrical configuration and sizes of the nozzle (resonator) on value of the indicated characteristics is made. Experimental data are aduced.

Keywords: acoustic NLW, solid propellant, gas generator, experimental data, mathematical modeling