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APPLICATION OF BETA-DISTRIBUTION IN NUMERICAL SIMULATION OF ECOLOGICAL SAFETY ENSURING PROCESS

To ensure the localization of forest fires and reduce the ecological danger during these works rescuers practically creates a protective ground strips by using the explosion. Together with the simplicity of use, low cost and high efficiency, there are certain drawbacks associated with the use of explosives.

Proposed by A.M. Grishin etc. version of the fuel-air mixture formation by using the explosive charge, first used in ammunition of volume blast, does not reduce the risks during the operation of such charges.

The bulk of the detonation-capable mixture is distributed along the periphery of the cloud, which reduces the impact action with a corresponding increase in fuel consumption. It is known that the three-dimensional mathematical modeling of volume blast hose-charge action on the forest phytocenosis and vegetation carried out using non-stationary gas dynamics equations for compressed gas in the Cartesian coordinate system.

The existing software complex allows calculating the density, velocity, pressure, temperature of mixture, the concentration of mixture components (fuel, air and combustion products), and the rate of heat release within the limits each control volume mixture on each discrete time step.



From the metrological point of view in this situation we formally carry indirect measurement accuracy of which substantially dependent on the accuracy of measurement (or calculation) of variables included in the calculation formula. In the case where distribution of individual variables errors can be considered a normal, error distribution of output value in principle is different from normal. In practice for testing of these distributions normality used visual methods, such as histograms, normal probability graphs or numerical methods by using the estimation of asymmetry and excess coefficients.

But in case of inconsistency of the empirical distribution to the normal, which is usually presented as a histogram, becomes the question of searching or selection of the distribution, according to certain criteria and more accurately describes the empirical distribution.

The authors proposed approach to building the universal family of distributions, including approximation based on families of Pearson distributions that is one that covers a broad class of probability distributions, not close to normal.

Final thesis speaks about a variability and flexibility in solving the problem of approximation that under verification and substantiation the possibility of using beta-distribution allows use the proposed in the mathematical apparatus for determining parameters specified distribution when conducting research [1].

References

1. Vambol' S.O., Mischenko I.V., Kondratenko O.M., Burmenko O.A. (2015), "Aproksymacija zakonu rozpodilu eksperymental'nyh danyh za dopomogju beta-rozpodilu. Chastyna 1" [Approximation of the experimental data distribution law using the beta distribution. Part 1], *Herald of NTU "KhPI". Collection of scientific works. Series: Mathematical Modeling in Technique and Technologies*, no. 18 (1127), pp. 36 – 44. [in Ukrainian].