UDC 621.311.001.57

AUTOMATED SYSTEM RESEARCH DISTORTION OF THE CURVE SINUSOIDAL VOLTAGE FROM HIGHER HARMONICS

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The issue of quality of electricity is becoming more important due to its shortage and higher cost. At the same time, the distribution, conversion and consumption of electricity occur deterioration of quality, including distortion of sinusoidal currents and voltages.

The main sources of distortion are rectifiers, welding machines, induction furnaces, motors DC converters DC variable in modern electrical consumers with nonlinear current-voltage characteristics (office equipment, energy-saving light sources, regulating thyristor devices and frequency converters) and others. Research distortions analytical methods are rather cumbersome and not always possible.

The purpose of research ˜ develop a software system to study the characteristics of deterministic and random vibrations with multiple frequencies.

Materials and methods of research. The system is designed to automate research functional relationships (defined analytically or tabular) by constructing and output on the screen and (or) printer schedules and (or) tables. Communication with the user by using menu-based interface, which has a hierarchical structure. The system is implemented by using the tool set VS 2.0 company BORLAND.

Results. Multi modeling of complex vibrations that contains several harmonics is performed by adding the values of each harmonic point readout period.

The system provides the envelope calculation U fluctuations. Calculation of the "classical" envelope held only for narrow-band oscillations when the oscillation amplitude and phase fluctuations occur much more slowly than the fundamental frequency fluctuations.

UWB fluctuation wherein the oscillation u (t) may occur during the period of the basic oscillation, and their character is determined by the composition and values of Kn and φn harmonics. Moreover, for certain values of Kn and φn, the

curve u (t) occur more highs and the relationship between the amplitude and phase fluctuations is ambiguous. Therefore Oscillations u (t) with a maximum.

Multi defined envelope fluctuation is the true value of the oscillation amplitude equal to the measured idealized ultrawideband meter. Phase φ_n, which is achieved by the maximum value of u (φ_n) = U, Multi adopted by phase fluctuations.

The simulation results presented in the form of tables envelope values $U(K_n,\varphi_n)$ and phase $\Phi(K_n,\varphi_n)$ or graphs of functions depending on the mode of operation of a given system.

Random size with equally density distribution generated random number generator - a function Random.

Random variables, normally distributed, formed via Gauss.

Study of the statistical properties of the process and its envelope and phase (distribution function, expectation, standard deviation, etc.) Is carried out using the procedure Tabl.

Conclution

The system allows you to explore the form, envelope and phase determined multifrequency oscillations of multiple frequencies, depending on their spectral composition and the initial phases of harmonics make the table values baseband functions $U(K_n,\varphi_n)$ and phase $\Phi(K_n,\varphi_n)$, define the statistical characteristics of random mixtures of multiple medium frequencies. The system can be used to assess distortion sine wave voltage higher harmonics, and in particular their maximum permissible values, developing methods of minimizing these distortions, the definition of the EMC measurement errors of calculation amplitude, frequency and phase difference of the higher harmonics and others.