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Improving the Reliability of Simulating the Operation of an Induction Motor in Solving the Technical and Economic Problem

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Abstract The article is devoted to the control of the statistical laws of linear voltages reproduced on a computer during computational studies on an energy-economic model when solving the problem of choosing protection tools for induction motors operating in workshop electric networks of industrial enterprises with low-quality electricity. Simultaneous and continuous estimation of average values, variances, autocorrelation and cross-correlation functions of harmonics of linear voltages is based on the adaptive approach.

The article presents mathematical expressions for correcting the values of statistical quantities with the accumulation of information and proposes structural schemes for a comprehensive analysis of the results of reproduction of random variables and functions on a computer. The results of checking the values of the average values and dispersions of six harmonics of simulated linear voltages supplying an induction motor with a power of 7.5 kW are shown for the conditions of the rolling shop No. 1 of Dneprospetsstal LLC.

Keywords:

Induction motor, Electric networks, Linear voltages, Protection tools, Economic model, Electric energy

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