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Transient Stochastic Processes in Power Circuits of Electric Transport Systems

Abstract:
The analytical method for the purpose of analyzing the transient processes occurring in the power traction circuits of DC electric transport systems allowing to take into account existing stochastic character of electric traction voltages and currents has been proposed. The method is based on using a modified form of Duhamel's integral adapted to the theory of random processes, in which the weight function is determined by the solution of the Wiener-Hopf correlation integral equation. Based on relationships of the proposed method the numerical calculations of transient stochastic characteristics (the function of mathematical expectation, the function of correlation, root-mean square deviation and dispersion) of the locomotive current in freight train operation of the Prydniprovsk railway were carried out.

 Keywords:the method, correlation function, electric transport, transient process, a weight function, stochastic current, mathematical expectation, voltage

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