

STATISTICAL MATRIX REPRESENTATION OF TIME-VARYING ELECTRICAL SIGNALS. APPLICATION TO WIND GENERATOR CURRENTS

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ABSTRACT

The development of the technology over the years and the liberalization of the energy market have brought many technical and economical profits, but they have also modified power system operation. In order to accurately analyze the new operational conditions and characteristics, a voluminous measurement data are required. It is, therefore, very important to store this data in efficient way without losing any important information.

This paper deals with the statistical description of measurement data. A matrix representation is chosen in order to preserve the information about the temporal evolution of the recorded signal. Two matrix forms are investigated: transitions probabilities (Markov) matrix and transitions number matrix. In order to evaluate the degree of preservation of the time information, two applications of the statistical matrices are investigated: reconstruction and prediction. In deed, the availability of the information about the time evolution of the recorded data can be applied to restore the original signal from its corresponding matrix form. Another possible application is the forecasting of the electrical signals behaviour in the future. The methods are illustrated on real measurement data and applied in the case of wind generator measured currents.