智能电网

风电功率短期预测及非参数区间估计

周松林，茆美琴，苏建徽

合肥工业大学教育部光伏系统工程中心

摘要：

为满足电网规划的要求，风电功率预测系统不仅需要提供确切的预测值，还应该对预测值包含的风险做出合理的评估。利用人工神经网络预测风速、风向，并根据实测功率曲线获得风电功率预测值。分析了造成风电功率预测结果不确定的影响因素，提出一种基于预测误差分布特性统计分析的非参数置信区间估计方法，对各功率分区内的预测误差概率密度函数进行建模，并在确定性预测基础上求取概率性风电功率预测值。仿真结果验证了该方法的实用性与有效性。

关键词： 风电功率预测　实测功率曲线　预测误差分布　置信区间　非参数估计

Short-term Forecasting of Wind Power and Non-parametric Confidence Interval Estimation

ZHOU Songlin, MAO Meiqin, SU Jianhui

Research Center for Photovoltaic System Engineering Ministry of Education, Hefei University of Technology

Abstract:

To meet the requirements of network planning, the forecasting system of wind power should provide exact forecasted value and make a reasonable assessment of risk which implied in forecasted values. Artificial neural network was applied to forecasting wind speed and wind direction, and wind power forecasting results were achieved according to the measured power curve. The uncertainty factors of the wind power forecasting were analyzed, and a non-parametric confidence interval estimation method was proposed based on analyzing the statistical characteristics of forecast errors. By means of the method, a probability density function model for forecasting errors in each power section was established, and the probabilistic forecasting results of wind power were obtained on the base of deterministic forecasting. The practicality and effectiveness of the proposed approach are verified by simulation results.

Keywords: wind power forecasting　measured power curves　forecast error distribution confidence interval　non-parametric estimation

通讯作者：周松林

作者简介：

作者Email: zsl040908@163.com

参考文献：

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