



The Wind Power Application Research Based on The Fusion of Deterministic and Ensemble Prediction

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Using ECMWF(European Centre for Medium-Range Weather Forecasts) ensemble prediction products(10m and 100m wind ensemble prediction members) and professional numerical model products on wind power, after the comparative test and analysis, the fusion product of wind speeds in the wind farm A is designed, which is suitable for short term wind power forecasting and electric dispatch. In the paper, the value of ensemble average, maximum, minimum, and temporal and spatial distribution are analyzed according to multi statistic integration prediction, and then the probability information of extreme strong, weak and transition fluctuation of wind speeds is researched and extracted using probability distribution function and ensemble averaging technique, the most probable positions of the wind speeds fluctuation are pointed out, the magnitude deviation of the ensemble average products is calibrated by probability matching technique. The members of Bayesian probabilistic forecasting are attempted to integrate, thus the integrated Bayesian probabilistic forecasting representing the uncertainty of ECMWF ensemble prediction is obtained, the single value prediction is formed by calculating the different ensemble statistics at last. The wind shear indices are studied, and the single value prediction on the height of the wind turbines' hub is calculated by downscaling Method, which complements with the deterministic numerical model prediction each other. Through offering the optimum wind speeds forecasting curve on the height of the wind turbines' hub and the confidence interval of minimum and maximum, the study is aimed to reduce a single point estimate triggers a great risk to dispatching planning and wind farm operation decision making.