

Improvement of prediction of wind power generation output for an area and its sub-area by using monitoring data

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Introduction of power generation by renewable energy such as photovoltaics(PV) and wind power (WT) is worldwidely progressing. Since PV and WT power generation are markedly fluctuated due to the change of the wheather, there is concern about the stability of the electric power system. Therefore, we have been developing a prediction method of wind power generation output to contribute for the stabilization of electric power system.

In this method, the numerical forecast value provided by the Japan Meteorological Agency is downscaled using the weather model WRF and CFD model to predict the wind speed at the wind turbine, and the power output is predicted using the power curve. By adding the generated power output for each wind turbine obtained, the total output of the area is obtained.

In this study, we evaluated the accuracy by simulating the power generation output for each sub-area divided into eight in the Tohoku area and the total. It was confirmed that the accuracy was improved by performing the correction using the relationship between the past observational and prediction power generation output data. However, when the correction is performed on the basis of the observational data of the wind speed and the power output of each windmill, it is suggested that the accuracy is further improved, therefoe the more detailed measurement is still important.

Keywords: Wind power output prediction, wind power generation, Weather forecast, Monitoring data