Verification for 1 day time series of the near surface wind speed forecast from the numerical weather prediction model according to the classification of the surface pressure pattern

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To forecast the output from wind power generators, many forecast models are developed lately. Meteorological data are used as explanatory variables of forecast models in most cases. Numerical weather prediction (NWP) models are one of the major resources of meteorological data. The performance of NWP models depend on their representation of meteorological processes. Wind at a site is influenced by a variety of meteorological phenomenon on different temporal and spatial scales. Additionally topographical effects on the atmosphere increase the complexity of the wind near the ground. These factors form the characteristics of the near surface wind at a site.

In this work we investigated the characteristics for 1 day time series of near surface wind predicted using the NWP model and verified the prediction skill for the predicted 1 day time series according to the classification of surface pressure patterns. The surface pressure from the NWP mode is classified using the self-organization map (SOM) method. Composite 1 day time series of the near surface wind speed for each surface pressure patterns are computed from forecast data from one to twenty four hours ahead on the nearest grid of a ground observation station. Composite time series of observed wind speed is also computed. It is found that characteristics of time series for each surface pressure pattern is different. Comparing the composite of NWP time series with that of observed time series the accuracy are different between surface pressure patterns. This result indicates that the prediction skill for the near surface wind of the NWP model varies according to the surface pressure pattern.

Keywords: Wind speed, Numerical weather prediction, Classification, Time series