[JJ] Evening Poster | H (Human Geosciences) | H-RE Resource and Engineering Geology

[H-RE13]Availability of earth science data in renewable energy field

convener:Hideaki Ohtake(National Institute of advanced industrial and technology), Fumichika Uno(National Institute of Advanced Industrial Science and Technology), Teruhisa Shimada(弘前大学大学院理工学研究科, 共同), Daisuke Nohara(Central Research Institute of Electric Power Industry)

Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Renewable energy penetration is increasing dramatically in the world. Renewable energy power generations have become a strong presence in an electric power system. However, it is a challenge for renewable energy to be stable power sources due in part to natural variability of renewable energy and its uneven distribution. For effective use of renewable energy, a combinational of power resources (e.g., thermal power plants, hydropower systems) and energy storage technologies (e.g., pumped-storage power generation and storage battery system) should be desired. Therefore, we need to understand the amount of renewable resources, causes of variation, and the predictability of power output. Then, observation and forecast information from earth science field should be analyzed and applied to power energy field to achieve easy use of earth science databases.

Recently, observation databases from remote sensing technology and/or forecasts from numerical models have become essential for both renewable energy and electric power system fields. This proposed session needs your presentation from the whole of renewable energy fields (solar power, wind power, geothermal power, tidal power, wave power and biomass power generations). Our goal of this session is to exchange views with various researchers between renewable energy field and earth science field (e.g., usage-trends of earth science datasets for renewable energy field, the subjects in hand, earth science datasets availability, and a request from renewable energy field to earth science field, and so on).

[HRE13-P04]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

*Takeshi Watanabe[1], Masamichi Ohba[1], Daisuke Nohara[1], Shinji Kadokura[1] (1.Central Research Institute of Electic Power Industry)

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

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.