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

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

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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 combination 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-P02]Application of Meteorological data to future electrical power fields

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Recently, a lot of photovoltaics (PV) power systems have been installed in Japan islands. PV power generations can exceed electric power demand in a power grid in the future. Optimal control of other power plants (thermal power plants etc) and battery systems with PV power generation will be required for safe control of power systems. PV power forecasts based on a meteorological data including both observations and forecasts data can be useful information for an optimal control of other power systems. In our research group, HARPS in a JST CREST research project, impacts of solar power forecasts have been investigated in several research fields (e.g., optimal control of electrical power grids (called a unit commitment) and battery systems) under large PV installations. Furthermore, solar power resource assessments, regional PV power estimations and a failure detection of PV power systems have been also tried using a new geostationary satellite, Himawari 8/9. In this presentation, we will introduce the combination between meteorological data (observations and forecasts) and electrical power fields and share research problems.