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Numerical and statistical short term weather forecast in the context of SPADI project.

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Electric companies are currently trying to implement dynamic management in its distribution networks (Dynamic Line Rating - DLR technology) to optimize the transmission capacity of the available infrastructures in a safe and efficient way. The transmission capacity of overhead power lines is commonly determined by limitations on the conductor's temperature, characterized by its ampacity, both dependent on weather conditions. This fact, enables maximizes line utilization under all conditions according to calculations based on current weather conditions and forecasts, as opposed to static and conservative values.

In this paper we focus in numerical and statistical approaches implemented in the context of the SPADI project (Predictive system for dynamic management of overhead and underground power lines), dealing on how the weather forecast based on numerical and statistical techniques can contribute to the Dynamic Line Rating of distribution networks.

On one hand different aspects related with the implementation of a pre-operational meteorological forecast system based on WRF assimilating observational data with an hourly update cycle are shown. On the other hand some statistical techniques (as ARIMA – Kalman Filter technique) are used to forecast temperature and wind speed up to 6 hours. Final System is designed for very short-term forecast of different key meteorological variables to apply it in DLR techniques in the north of Iberian Peninsula.

The beneficial impacts of high-resolution (in space and time) wind and temperature observations on very short-range numerical weather forecasting are presented. Finally some results about the accuracy and performance of its pre-operational application will be shown.