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Very short term photovoltaic power generation forecast over La Reunion island: definition of a reference method

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In the La Réunion island, a french overseas department located in the indian ocean, there is a large increase of intermittent electric power generation, which could lead to reach the limit of 30% of intermittent renewable energy connected to the electric network by the year 2011. This strong penetration of intermittent power generation may disrupt the stability of the electric system. A way to limit this is to forecast the electric power generation : another power generation source can indeed be mobilized if a fall is anticipated. In order to help the development of intermittent renewable energy, EDF R&D has been working for a few years on methods to forecast the intermittent power generation. The interesting horizons of the prediction vary from very short term (a few minutes to a few hours) to short term (a few hours to a few days).

In the photovoltaïc field, different forecast methods are studied (among which [1]). The aim of this study is to define a very short term forecast reference method for the PV power generation, in order to evaluate the performances of the methods being developed. Usual reference methods are based either on climatology, on persistence, or on similarity between the meteorological situations leading to similar power generation (analog method). We will compare the different usual methods and see how to create a « good » reference model for very short term forecasting. By « good » reference model, we mean that it can be useful to the electric network manager, and can replace a more sophisticated forecast method if necessary.

[1] « Relation between photovoltaïc power generation and synoptic weather regimes in La Réunion », J . Najac, B. He, C. Chaussin, submitted to EMS 2011