On the simulation of aggregated solar PV forecast errors

The uncertainty arising from high levels of solar photovoltaic (PV) penetration can have a substantial impact on power system operation. Therefore, there is a need to develop models capable of representing PV generation in a rigorous manner. This paper introduces a novel transformation-based methodology to generate stochastic solar area power forecast scenarios; easy to apply to new locations. We present a simulation study comparing day-ahead solar forecast errors covering regions with different geographical sizes, total installed capacities and climatic characteristics. The results show that our model can capture the spatio-temporal properties and match the long-term statistical properties of actual data. Hence, it can be used to characterize the PV input uncertainty in power system studies.

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