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Use of offsite data to improve short term wind power ramp forecasting

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Offsite data from a variety of sources can prove valuable to short term ramp prediction for wind power forecasts. Traditional methods often rely on data assimilation into mesoscale numerical weather models, a process that can be computationally expensive, time consuming and, in some cases, only marginally effective. Advances in data mining and pattern recognition algorithms provide a complement to NWP.

We present the results of several experimental forecasts that integrate reliable offsite data sources via regional pattern matching, from sites in the US Northern Rockies and West Texas. In both experiments, traditional bulk accuracy metrics were observed to improve at short horizons in each experiment, but metrics specifically computed to track ramp capture ability also showed marked improvement over standard NWP and persistence.

We demonstrate that over these tested domains, properly-trained clustering and pattern matching of real-time regional measurements can provide superior forecasts of events during highly-volatile periods