

Proposal of two new 46 criteria to assess solar forecasting performances

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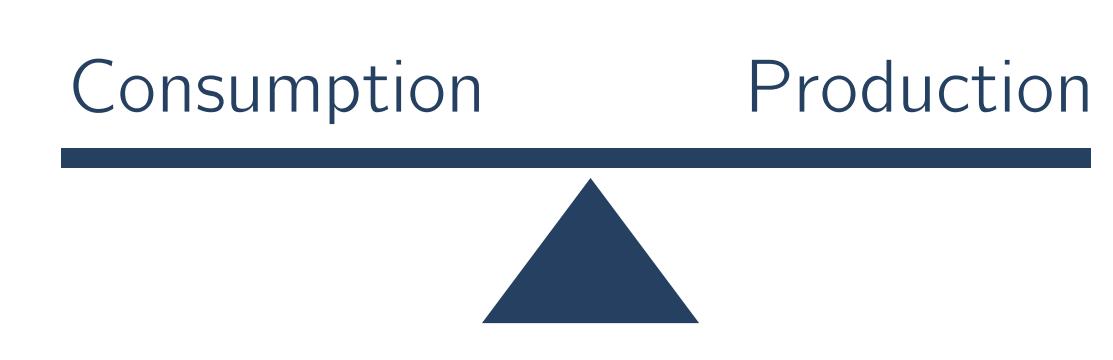
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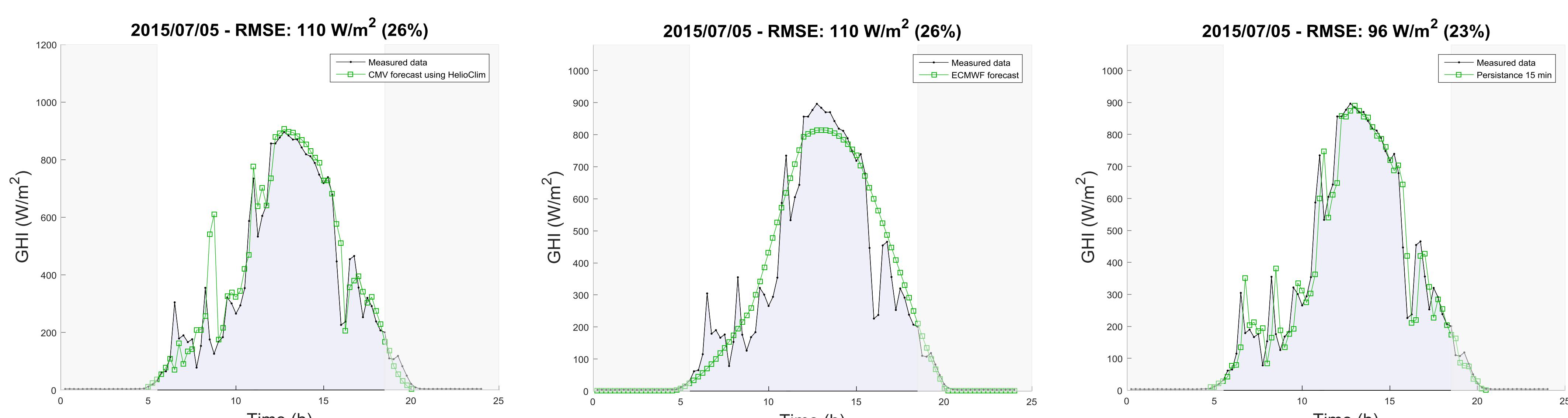
Context

- Solar energy depends on weather conditions \Rightarrow high temporal variability
- The high variability of solar production has consequences on the electrical grid:
 \Rightarrow need to introduce increasingly accurate forecasts of photovoltaic production
- Need to establish a standardized procedure to assess solar forecast accuracy

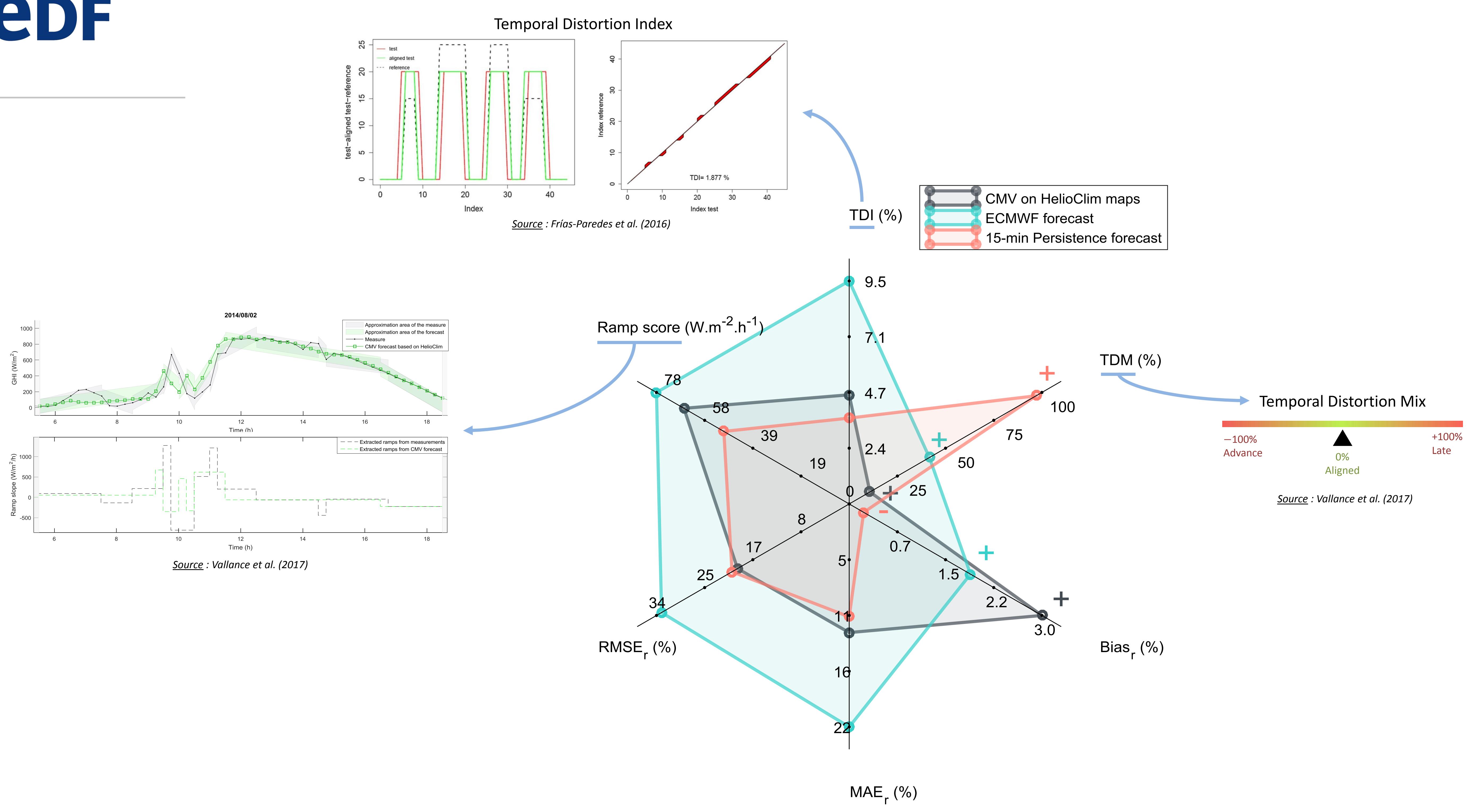


Illustrations of RMSE limitations

The root mean square error (RMSE) – in absolute or in relative terms – is the most commonly used metric in solar forecast evaluation. Although this metric provides comprehensive global information on forecast errors, it can be misleading and insufficient to characterize the behavior of forecast results. To highlight some of the weaknesses of this metric, a concrete real example is presented below :



Definition of two new criteria : a ramp and a time alignment metric



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Conclusion

- Introduction of two new metrics: a ramp score quantifying the ability to follow ramp events, and the TDM derived from the estimation of the global temporal distortion between the forecast and the measurements, quantifying the alignment of the two time series.
- The resulting scores of the new metrics presented correspond to the established behavior of three illustrative 15-min forecasts and allow a better understanding of each method's characteristics.

Acknowledgements

- Vallance, L., Charbonnier, B., Paul, N., Dubost, S., Blanc, P., 2017. Towards a standardized procedure to assess solar forecast accuracy: A new ramp and time alignment metric. Solar Energy 150, 408–422. [doi:10.1016/j.solener.2017.04.064](https://doi.org/10.1016/j.solener.2017.04.064)
- Frías-Paredes, L., Mallor, F., León, T., Gastón-Romeo, M., 2016. Introducing the Temporal Distortion Index to perform a bidimensional analysis of renewable energy forecast. Energy 94, 180–194. [doi:10.1016/j.energy.2015.10.093](https://doi.org/10.1016/j.energy.2015.10.093)
- Florita, A., Hodge, B., Orwig, K., 2013. Identifying wind and solar ramping events. Green Technol. Conf. IEEE 147–152. [doi:10.1109/GreenTech.2013.30](https://doi.org/10.1109/GreenTech.2013.30)