



All Sky Imagers nowcasting – Outlook and future perspectives

Andreas Kazantzidis

Webinar – 15.12.2022

Take home messages from the benchmarking exercise



- The Task 16 ASI benchmarking was the first attempt to place next to each other and compare prototypes or semi-prototypes. Different hardware and software modules were compared in a “blind” campaign, for the first time.
- The ASI campaign and its outcomes have been proved beneficial to all participating groups. Nowadays, new algorithms and better approaches are developed, based on the outcomes of this benchmarking.
- Deeper investigation and comparison on specific parameters affecting the nowcasts (e.g. cloud velocity and cover, aerosols) would be beneficial.
- Apart from GHI, DNI forecasts should be investigated, too.

Take home messages from the benchmarking exercise



- The ASI-derived solar irradiance forecasts can outperform the traditional persistence models even under clear, scattered, and overcast skies.
- All of them are proved to be efficient under cloudy skies. Some of them outperform the persistence models at all cloud clusters and time horizons.
- ASI systems can be used for solar irradiance ramp event detection, correctly capturing the ramp events from 30% to 95% of the cases. Their performance in true ramp event cases decreases as the time horizon increases.

Future perspectives for ASI nowcasting: how we could increase their performance?



- The combination of visual and infrared modules to increase the derived information for clouds: cloud base heights and cloud information close to the Sun are crucial.
- The combination of hi-end and low cost systems as well as networks to increase the spatial and temporal information.
- ASI networks can provide valuable information on the detection/characterization of clouds as well as to have observational information of the 3D cloud structure. These are important to forecast the change of cloud shape.



For this scope, innovative and flexible systems of ASIs and ancillary meteorological/atmospheric/solar measurements with the synergy of physical models, methods of computational vision and deep learning are expected.

The future activities of Task 16 on ASIs (2023-2026)



- Integration of cloud classification.
- Measurement of irradiance with ASIs and validation with local pyranometers.
- Forecasts using ASI networks for extended areas and longer forecast horizons.
- Improvement of Energy Management Systems with skycams / forecasts.
- Comparison and Combination of ASI and satellite-based forecasting.
- Comparison of MTG and MSG based predictions (with focus on irradiance, single sites and ramps).
 - Further development of applied and user-oriented evaluation metrics and determination of added economic value of using ASI-based forecasting



To transform ASIs to
reliable, robust and high quality instruments
for the meteorology/atmospheric science
and solar energy sectors.

- Hopefully, ASI benchmarking paves the way for this scope

Stavros-Andreas Logothetis, Vasileios Salamalikis, Stefan Wilbert, Jan Remund, Luis F. Zarzalejo, Yu Xie, Bijan Nouri, Evangelos Ntavelis, Julien Nou, Niels Hendriks Lennard Visser, Manajit Sengupta, Mário Pó, Remi Chauvin, Stephane Grieu, Wilfried van Sark and Andreas Kazantzidis

Special thanks to CIEMAT and DLR

Special thanks to Wilfried van Shark, Elke Lorenz and Jan Remund



Thank you all