

METAS: Meteorological Station for Solar Technologies



CIEMAT-PSA instruments

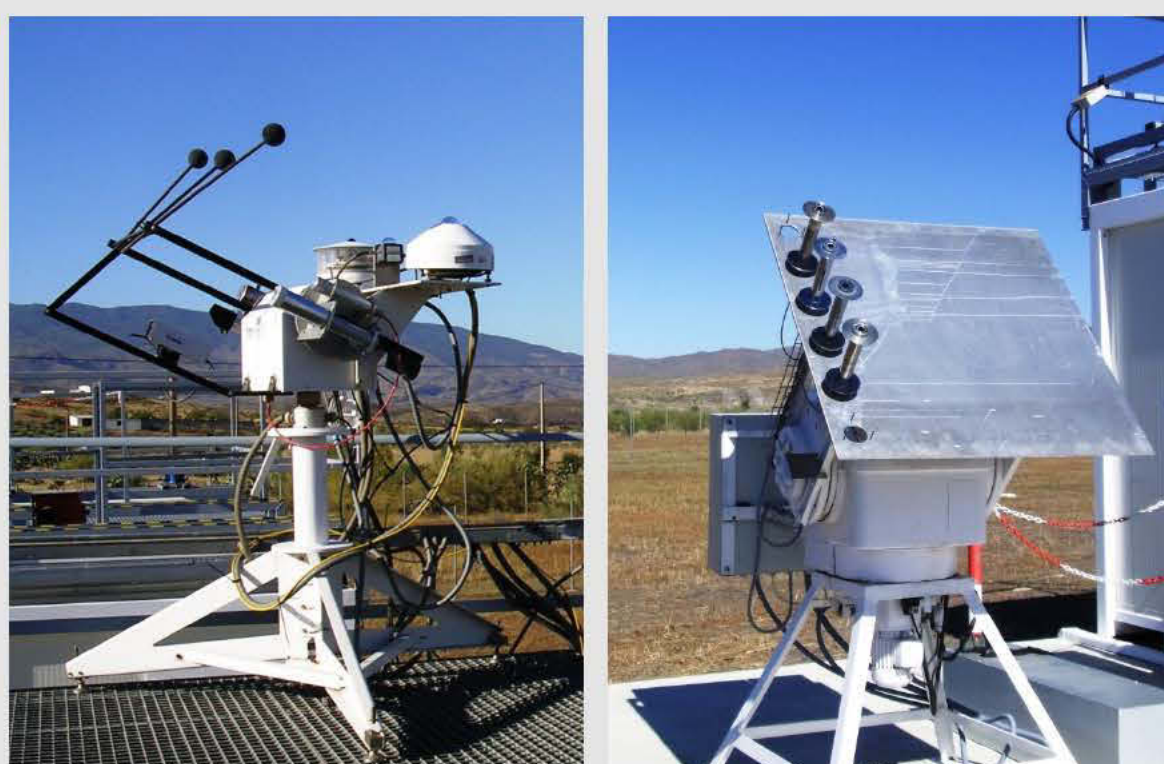
PSA is one of the most relevant research facilities for CSP in the world.

In 1988 PSA's meteorological station was established for measuring solar radiation (global, direct and diffuse radiation) and other weather variables that are relevant for solar technologies.

The station is a full member of World Meteorological Organization's Baseline Surface Radiation Network, whose directives it follows since October 2005.



The main interests of the solar radiation characterization at PSA are to analyze relationships between solar variables, to assess low-cost atmospheric attenuation devices, to improve estimations from satellite images, to analyze the spectral distribution of solar radiation under different conditions, and to test the international standards for the calibration of solar irradiance sensors.



DLR instruments



Meteorological information is essential for the design, operation and qualification of CSP plants and their components. DLR's Institute of Solar Research determines the meteorological parameters that are relevant for CSP.

Accurate measurements of DNI are crucial for the uncertainty of the overall efficiency measurement of a CSP collector. This type of measurements is obtained by thoroughly calibrated pyrheliometers.



DLR characterizes robust measurement instruments as Rotating Shadowband Irradiometers, that require less maintenance and are often used at remote sites for solar resource assessment.

Advanced measurands for solar resource assessment and CSP qualification are also investigated. For example the sunshape, atmospheric extinction and the soiling of plant components are determined. In this framework aerosol and cloud properties are of importance. Therefore, DLR operates an AERONET sunphotometer, a LIDAR, a ceilometer and further dedicated instrumentation.

METAS objective

Jointly develop activities related to solar irradiance measurements for resource assessment. METAS started within the framework of a **collaboration agreement** that was signed in 2012.

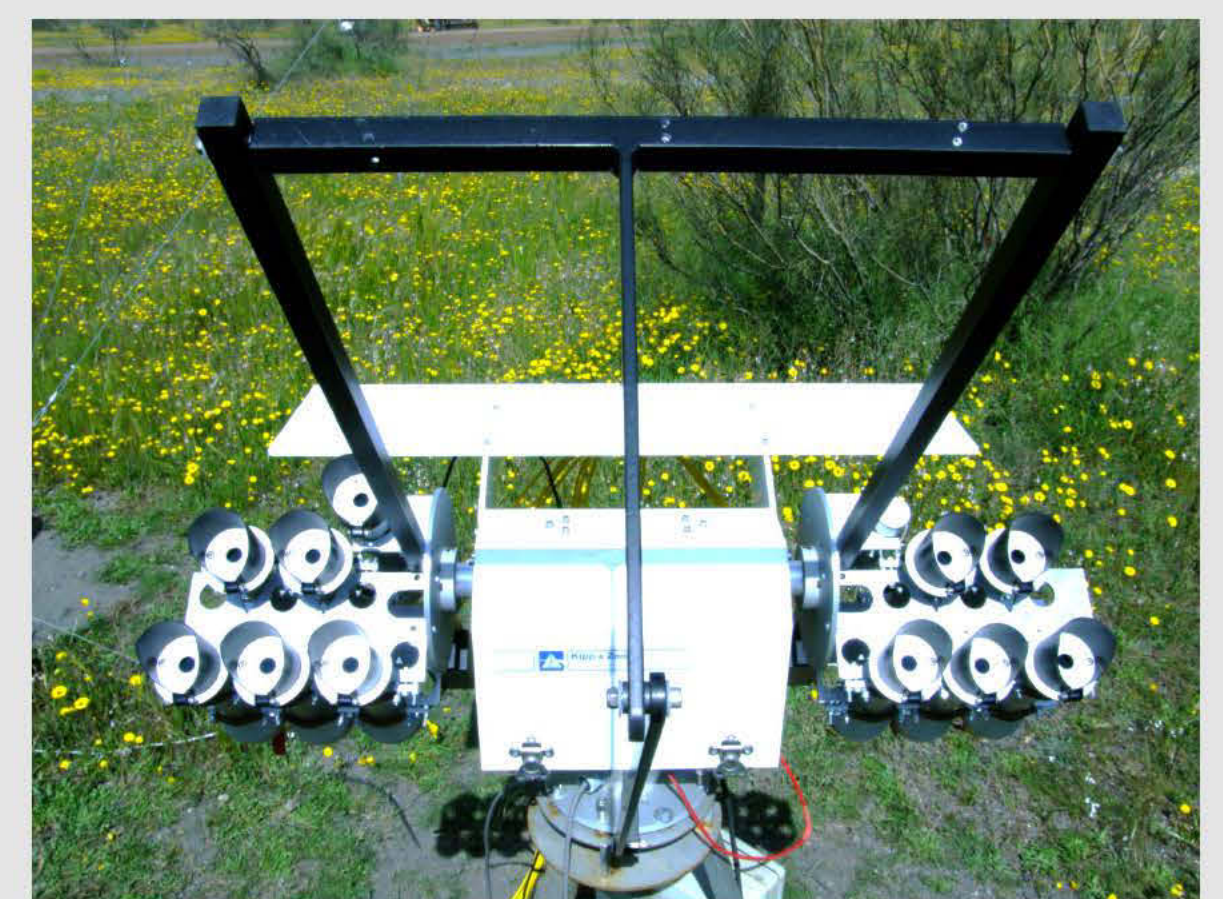
Main activities

Coordinating the use of measuring equipment included in the METAS installation.

Production of reference meteorological datasets.

- ✓ Analysis of spatial variation of DNI.
- ✓ Creation of Typical Meteorological Years (TMY) and/or Representative Radiation Years (ASR), etc.
- ✓ Standardization and integrating procedures for data bankability, data quality control and treatment, integration of data sources, and evaluation of meteorological parameters.

Pyranometer and pyrliometer calibration with absolute cavity radiometers (ACRs) following international standards.



Lourdes Ramírez (CIEMAT Solar Radiation Group)
Luis F. Zarzalejo (CIEMAT Solar Radiation Group)
Rita X. Valenzuela (CIEMAT Solar Radiation Group)
Jesús Polo (CIEMAT Solar Radiation Group)

Stefan Wilbert (DLR Inst. of Solar Research)
Fabian Wolfertstetter (DLR Inst. of Solar Research)
Natalie Hanrieder (DLR Inst. of Solar Research)
Bijan Nouri (DLR Inst. of Solar Research)

Ginés García (PSA Data and Instrumentation)
José Liria (PSA Data and Instrumentation)
Antonio Campos (PSA Direction)