

Location of the infrastructure :

Kassel, Germany

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Objectives :

PVTestlab - Outdoor PV-Module and system performance

Main features :

PVTestlab – Outdoor PV-Module and system performance

- Monitoring under DERLab-methods
- MPP-Tracker - digital and analog measurement on 1 min time interval together with solar cell sensor, module- and ambient temperature
 - Digital IV-Curve measurement (256 IV-pairs)
 - Analog MPP-Tracker
- Spectral irradiance on 30° tilt angle and south orientation on 1 min time interval
- Meteorological data
- Outdoor monitoring
 - PV module integrated inverters together with other electronic integrated components
 - PV System; PV modules with inverters
 - Potential Induced Degradation (PID) measurement



Limitations or constraints :

The access will be allowed with technical and scientific assistance from IWES.

Typical services or results :

- DERLab methods; the module characterization could be evaluated among other test fields.
- IV-Measurements; the degradation and annealing effects together with temperature coefficient and fill-factor could be evaluated on module level under different conditions. With 1 min MPP-Tracker, the module modelling could be achieved.
- Spectral irradiance; the power output of different PV-technologies could be evaluated under weak-light and high AM conditions based on spectral irradiance data, especially for 2nd and 3rd generation of PV module
- Outdoor monitoring
 - Reliability evaluation of electronic elements
 - Interaction to energy management for home and grid integration
 - Model development of modules and systems configurations.
 - Degradation under system configuration; especially under operating voltage

Examples of research projects :

- Harmonised module outdoor measurement under DERLab methods to achieve the same boundary conditions
- PV module modelling based on Artificial Neuronal Network and power balance
- Round Robin Test for solar cell sensors