



COST Action CA16202

User Workshop

The effect of Soiling on Solar Energy

InterSolar, Munich, Germany, 16 May 2019

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 #COSTinDust



Barcelona
Supercomputing
Center
Centro Nacional de Supercomputación

Knowledge for Tomorrow

International Network to Encourage the Use of Monitoring and Forecasting Dust Products

inDust

COST Action CA16202

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InDust goals

- To **establish a network** involving research institutions, service providers and potential end users of information on airborne dust.
- To **coordinate** and **harmonise** the process of transferring dust observations and predictions to users (including researchers and stakeholders).
- To **assist** the diverse socio-economic sectors affected by the presence of high concentrations of airborne mineral dust.

**inDust is looking for
dust user-oriented services**



The Effect of Dust on Solar Energy

- The presence of dust **reduce the incoming solar irradiance** through the direct radiative effect
- but also indirectly, through favoring **cloud formation**
- **Soiling:** affects panels/mirror efficiency and water management



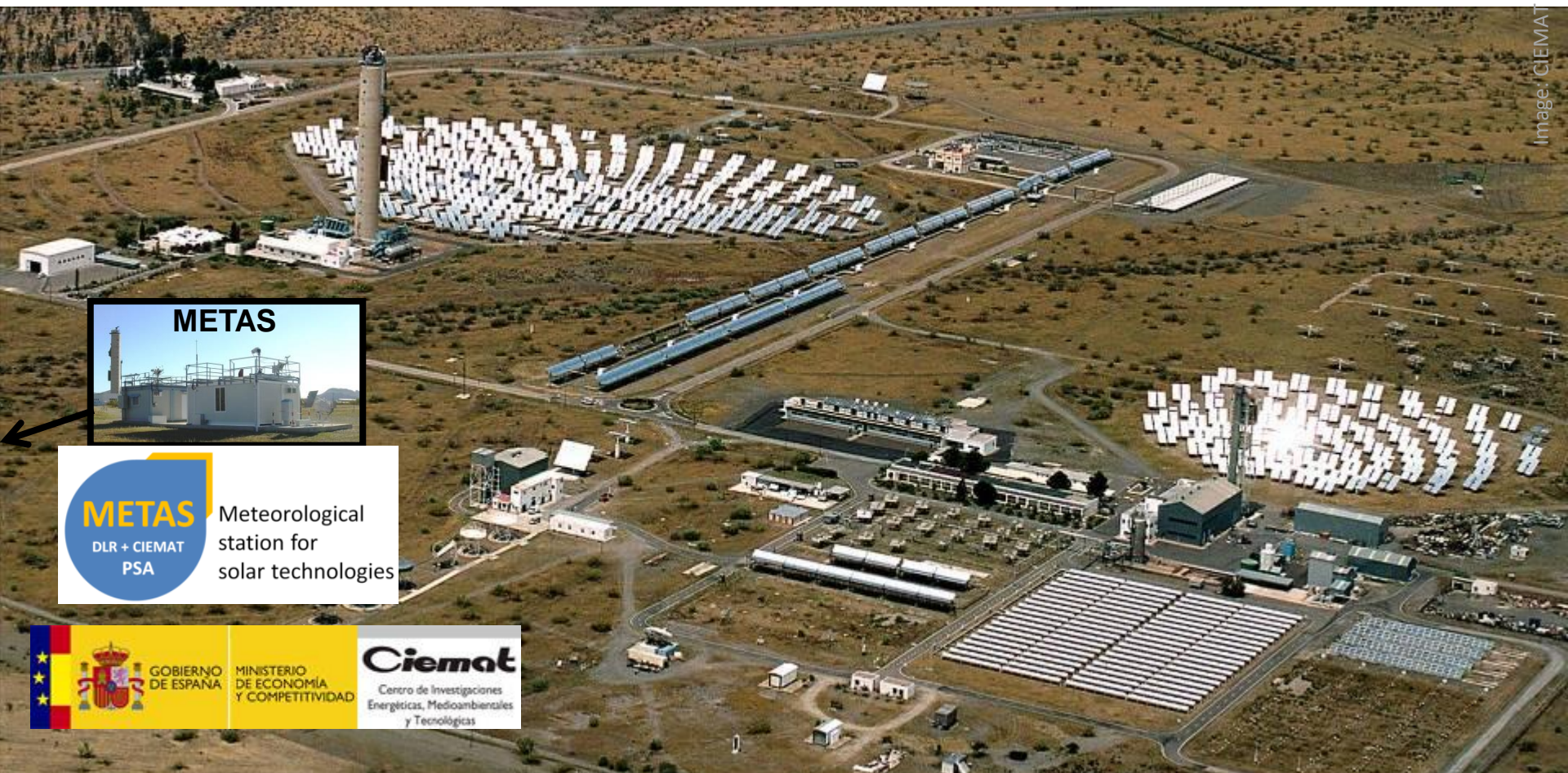
→ User Workshop is organized by the German Aerospace Center DLR
Institute for Solar Research
Energy Meteorology Group



German Aerospace Center DLR – Institute for Solar Research – delegation at PSA

PLATAFORMA SOLAR DE ALMERÍA

... is one of the biggest facilities for research, testing and development of solar technologies and applications (CSP)



METAS

METAS
DLR + CIEMAT
PSA

Meteorological
station for
solar technologies

Meteorological Activities at DLR and within METAS

Solar radiation measurements

Standardization

Instrument calibration

Instrument characterization

Soiling of mirrors/panels

Solar Technology



enerMENA network

Circumsolar radiation

Nowcasting & irradiance grid

Aging of mirrors

Beam attenuation in tower plants





The Effect of Soiling on Solar Energy

13:00-13:05	Welcome and Introduction InDust COST Action	Dr. Natalie Hanrieder (German Aerospace Center DLR)
13:05-13:25	Microstructural investigations of soiling processes in desert environments	Klemens Ilse (CSP Fraunhofer Institute)
13:25-13:45	Soiling measurements in photovoltaic applications and concentrated solar power plants	Dr. Frank Wagner (Karlsruhe Institute of Technology KIT, Institute for Meteorology and Climate Research)
13:45-14:05	Atmospheric dust transport models and usage	Dr. Elina Karnezi (Barcelona Supercomputing Center BSC)
14:05-14:25	Soiling modelling with ground data	Dr. Fabian Wolfertstetter (German Aerospace Center DLR), Dr. Leonardo Micheli (University Jaen)
14:25-14:45	Optimized cleaning strategies for CSP and implementation examples	Dr. Fabian Wolfertstetter (German Aerospace Center DLR)
14:45-15:15	Coffee break	



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The Effect of Soiling on Solar Energy

15:15-15:35	Soiling strategy development	Gerhard Mütter (Alteso)
15:35-15:55	Energy yield of PV power plants - Approaches for the determination of yield losses due to dust soiling in desert climates	Dr. Werner Herrmann (TÜV Rheinland)
15:55-16:15	Application of soiling measurements for cleaning optimization and yield gain in CSP plants	Dr. Anna Heimsath (ISE Fraunhofer Institute)
16:15-16:35	Measuring soiling impact on solar power plants and their application for monitoring CSP and PV plants	Dr. Richard Meyer (Suntrace)
16:35-16:55	PV Soiling Measurements: Cleaning optimization and Mitigation	Bill Stueve (Atonometrics, Inc.)
16:55-17:15	Application of soiling monitoring in solar power plants	Dr. Marc Korevaar (Kipp&Zonen)
17:15-17:45	Discussion: What is needed?	All





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InDust and DLR thank you for your attention!



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