

No.5
SEPT.
2026

SCIDOSOL

newsletter

open science
FOR THE SOLAR
community



On the agenda

Meet our new intern

Fiona Layes

Fish-eye imager

Do-it-yourself workshop

From Sophia Antipolis to the Arctic

The fish-eye imager
aboard an expedition

ABC-Rad

An open dataset
following FAIR principles

IEA PVPS Task 16

SciDoSol's involvement
in Phase IV

Open science and scientific dissemination

Latest scientific articles,
open data and conferences

EDITO

We are pleased to present the fifth edition of the SciDoSol newsletter.

In this issue, we highlight how our sponsorship research chair **puts open science into practice**. It promotes knowledge transfer to industry and the scientific community by sharing research outcomes and making resources openly available.

The development and dissemination of an open-source fish-eye imager, the creation of the open ABC-Rad dataset, our participation in IEA PVPS Task 16, and our scientific publications are all concrete examples of this approach.

Enjoy your reading,
The SciDoSol team.

SOLAR WINTER
SCHOOL 2027

Save the date!
March 15–19



Meet our new intern

FIONA LAYES

Fiona is pursuing a **Master's degree in Electrical Engineering** at **TU Wien**. She joins SciDoSol for a **six-month internship** to work on her diploma thesis. Her project builds on her participation in the **2026 Solar Winter School** and the **All Sky Imager Workshop**.

She is using a self-built pyranometer combined with two narrow bandpass filters targeting wavelengths in and around the water vapor absorption band.

Her project aims to determine how closely Total Column Water Vapor measurements obtained with this device can approach the performance of NASA's sun photometer.

Objectives:

- Improve the temporal and spatial resolution of Total Column Water Vapor measurements using a low-cost measurement system.
- Co-locate the filtered pyranometer with the All Sky Imager on the same measurement platform to enable combined data analysis.

3-DAY WORKSHOP

DO-IT-YOURSELF FISH-EYE IMAGER WORKSHOP

Three days, 10 fish-eye imagers and one shared goal: making all-sky imaging more accessible through a low-cost, open-source solution.

June 16–18, 2026
Sophia Antipolis

10 imagers built
180° field of view

From an idea to
an open-source
fish-eye imager



From an idea to an open-source imager

- Commercial all-sky imagers are expensive, rarely give users access to raw images and offer little freedom to configure camera parameters.
- SciDoSol has developed an alternative: a low-cost, open-source fish-eye imager built from readily available components.

What started as **Valentin Bauer's internship project** within SciDoSol, in collaboration with the Energy&IT Group at the ICT of TU Wien, has evolved into an autonomous device now being put into practice with other researchers and practitioners.



From components to imagers

From June 16 to 18, 2026, participants gathered at the Pierre Laffitte campus in Sophia Antipolis to build their own fish-eye imagers from scratch, using guides prepared by the SciDoSol team.



Day 1 BUILD

Hardware assembly

Day 2 SET UP & CALIBRATE

Device start-up and geometric calibration

Day 3 WORK WITH DATA

Data retrieval, encoding and archiving, discussion on applications

By the end of the workshop, they had built 10 fully assembled imagers, each providing a 180° field of view.

◀ Assembly in action

Participants represented Mines Paris – PSL, TU Wien, SOMFY, CalibSun and the German Umweltbundesamt.



FROM 2 PROTOTYPES
(Sophia Antipolis + Baku in Vienna)
TO 14 IMAGERS

2 + 2 + 10

initial
prototypes

SOMFY
imagers

workshop
imagers

◀ Fish-eye image taken by one of the imagers, showing the participants alongside the imagers they assembled.

What can the imagers be used for?

CLOUDS

Cloud detection and motion forecasting

SOLAR ENERGY

Solar radiance measurements and estimation of solar irradiance on tilted surfaces

ATMOSPHERE & WEATHER

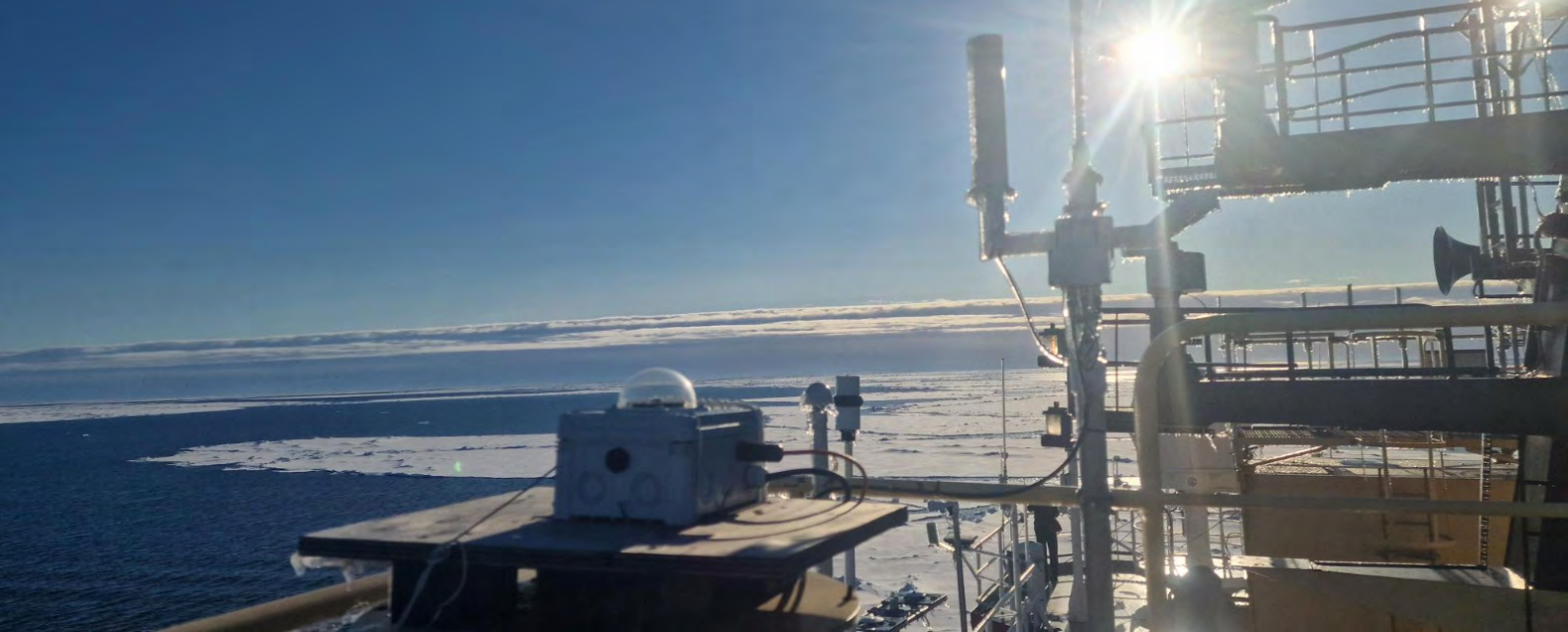
Atmospheric and meteorological applications

An open science approach

Participant feedback is now being used to **refine the blueprints and do-it-yourself guides**.

In line with SciDoSol's **open-science and open-data approach**, these resources will be **made openly available** to the community alongside a research article.





FROM SOPHIA ANTIPOLIS TO THE ARCTIC

SCIENCE IN THE FIELD

From August 10 to September 20, 2026, the Swedish icebreaker *Oden* and the Canadian Coast Guard Ship *Louis S. St-Laurent* conducted **a joint six-week expedition to the Central Arctic Ocean.**

An international **Early Career Researcher Program** focused on the central Arctic climate system was held aboard the *Oden*.

SciDoSol's fish-eye imager was part of the scientific equipment used during the expedition, bringing the technology developed and shared within SciDoSol into the extreme Arctic environment.

The open-source, low-cost fish-eye imager aboard the Canada–Sweden Arctic Ocean 2026 expedition.



ABC-Rad

an open dataset

FOLLOWING FAIR PRINCIPLES

Compiled within SciDoSol, ABC-Rad (AERONET-BSRN-CAMS-Radiation) combines data from 24 BSRN stations worldwide with co-located AERONET data, CAMS Radiation Service estimates and modelled circumsolar irradiance.



What does ABC-Rad include?

BSRN

Downwelling surface solar irradiance measurements

AERONET

Co-located aerosol optical properties

CAMS Radiation Service

McClear cloud-free solar irradiance estimates

Modelled circumsolar irradiance

All data are quality-controlled and cloud-screened to retain cloud-free instances only.

◀ Map of the world showing the geographic locations of the 24 BSRN stations

What can ABC-Rad be used for?

The dataset facilitates:

- data-driven research
- model calibration and validation
- development of benchmarking frameworks

It is of value to scientists or practitioners studying the **effects of aerosols on downwelling surface solar irradiance**.

The inclusion of **modelled circumsolar data** is also useful to those working with this variable.

The study by SciDoSol researchers on the effects of the circumsolar irradiance and aerosols on CAMS clear-sky retrievals used this specific dataset.

FAIR IN PRACTICE

ABC-Rad follows the FAIR principles in practice, benefiting from the framework established by the Centre O.I.E. of Mines Paris – PSL.

Open data is only useful if others can find it, operate with it and cite it.

FINDABLE **A**CCESIBLE **I**NTEROPERABLE **R**EUSABLE

The framework behind ABC-Rad

LIBINSITU

The open-source Python library developed at Centre O.I.E. standardizes in situ data from all 24 stations in NetCDF format following CF conventions, with harmonized metadata.

WEBSERVICE-ENERGY CATALOGUE

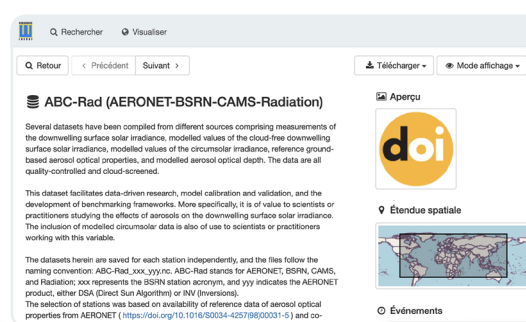
Developed by Centre O.I.E., the catalogue includes the description and access to the dataset. No registration is required.

THREDDS DATA SERVER

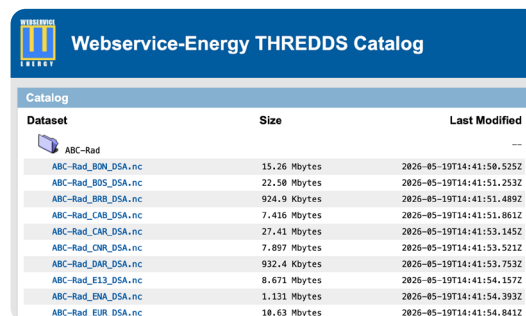
The server hosts the data and provides access to them, along with the relevant metadata.

DATA CITE DOI

A permanent, citable identifier is associated with the dataset.



ABC-Rad in the Webservice-Energy Catalogue



Dataset	Size	Last Modified
ABC-Rad		
ABC-Rad_B0W_DSA.nc	15.26 Mbytes	2026-05-10T14:41:50.525Z
ABC-Rad_B0S_DSA.nc	22.58 Mbytes	2026-05-10T14:41:51.253Z
ABC-Rad_B0B_DSA.nc	924.9 Kbytes	2026-05-10T14:41:51.489Z
ABC-Rad_CAB_DSA.nc	7.416 Mbytes	2026-05-10T14:41:51.861Z
ABC-Rad_CAR_DSA.nc	27.41 Mbytes	2026-05-10T14:41:53.145Z
ABC-Rad_OAR_DSA.nc	7.897 Mbytes	2026-05-10T14:41:53.521Z
ABC-Rad_OAR_DSA.nc	932.4 Kbytes	2026-05-10T14:41:53.753Z
ABC-Rad_E13_DSA.nc	8.671 Mbytes	2026-05-10T14:41:54.157Z
ABC-Rad_ENA_DSA.nc	1.131 Mbytes	2026-05-10T14:41:54.393Z
ABC-Rad_EUR_DSA.nc	10.63 Mbytes	2026-05-10T14:41:54.841Z

ABC-Rad data available through the Webservice-Energy THREDDS Catalog

LICENCE

The compiled and harmonized dataset is licensed under Creative Commons Attribution 4.0 International (CC BY 4.0).

ABC-Rad incorporates data products originating from AERONET, BSRN and CAMS. The original source datasets remain subject to their respective licences, terms of use and attribution requirements.

CREATORS

Yehia EISSA, Yves-Marie SAINT-DRENAN, Philippe BLANC, Raphaël JOLIVET, Lionel MENARD, Gabriel CHESNOIU.





IEA PVPS Task 16

The team of SciDoSol researchers remains actively involved in the new Phase IV of IEA PVPS Task 16 (July 2026 – June 2029), a joint task with IEA SolarPACES.

Through its continued involvement, SciDoSol contributes actively to the international solar resource community.

Theme of Task 16:

Solar resource for high penetration and large-scale applications.

Phase IV includes
20 COUNTRIES,
represented by
45 INSTITUTIONS.

France is
represented by
Mines Paris – PSL
through SciDoSol.



SciDoSol experts involved in Task 16

- Yehia EISSA
- Yves-Marie SAINT-DRENAN
- Susanne WEYAND
- Valentin BAUER



SciDoSol leads Subtask 3 "FOCUS TOPICS"

- | | |
|--------------|-----------------------------------|
| ACTIVITY 3.1 | Benchmarks and data practices |
| ACTIVITY 3.2 | Climate change and extreme events |
| ACTIVITY 3.3 | Firm power generation |
| ACTIVITY 3.4 | Best practices for AI |

SciDoSol also co-leads 3 ACTIVITIES

- | | |
|-----|--|
| 1.2 | Radiation models
Co-led with NLR |
| 3.1 | Benchmarks & data practices
Co-led with DTU |
| 4.3 | Solar Resource Handbook
Co-led with NLR |



open science and scientific dissemination

Explore SciDoSol's latest publications, open data and contributions to international conferences.

CONFERENCES

MAY 3-8, 2026

Vienna, Austria

EGU General Assembly 2026

Spatial solar irradiance emulation of Monte Carlo ray tracing with multi-view all-sky imagery

[View contribution](#) 

JULY 15-17, 2026

Gran Canaria, Spain

ITISE 2026

Spectral fidelity of diffusion models for surface solar irradiance downscaling: why regime-conditioned evaluation matters?

SEPTEMBER 6-11, 2026

Utrecht, The Netherlands

EMS Annual Meeting 2026

A physics-informed diffusion model for surface solar irradiance temporal downscaling

[View contribution](#) 

SEPTEMBER 14-18, 2026

Rotterdam, The Netherlands

EU PVSEC 2026

IEA PVPS Task 16 – Phase IV: Solar resource for high penetration and large-scale applications

[Learn more in this newsletter](#) 

LATEST PUBLICATIONS

NEWLY ACCEPTED

Spatial context importance in deep learning for global horizontal irradiance estimation from satellite imagery

Solar Energy (2026)

[Read the paper](#) 🔗

NEWLY ACCEPTED

(with contributions from SciDoSol researchers)

SOLARSPECTRA, a new physical transposition model to estimate all-sky spectral tilted solar irradiance

Solar Energy (2026)

[Read the paper](#) 🔗

NEWLY ACCEPTED

Impact of circumsolar irradiance and aerosol optical depth on CAMS surface solar irradiance estimates

Renewable Energy (2026)

[Read the paper](#) 🔗

NEW PREPRINT

MuscaDet – A multiscale and uncertainty-aware detector of cloud-free periods in time series of 1 min measurements of solar irradiance at ground level

EGUsphere (2026)

[Read the preprint](#) 🔗

OPEN DATASET

Presented in this newsletter: ABC-Rad (AERONET-BSRN-CAMS-Radiation)

Mines Paris – PSL (2025)

[Access the dataset](#) 🔗 [Presentation](#) 🔗



solar winter SCHOOL 2027

save THE DATE!

In Sophia Antipolis,
on the week of
March 15–19, 2027

contacts

🌐 www.scidosol.fr

✉ contact@scidosol.fr

☎ +33 (0)4 93 95 74 04

SCIDOSOL

Center O.I.E., MINES Paris – PSL
Campus Pierre Laffitte
1 rue Claude Daunesse – CS 10207
06904 Sophia Antipolis



Newsletter Resources: Philippe Blanc and Yehia Eissa

Content Strategy: Philippe Blanc and SKISLY (Odile Algrain)

Writing: SKISLY – **Graphic Design:** Elodie Algrain

Editor-in-Chief: Philippe Blanc