

MeLi Dos

Metrology for wearable light loggers and optical radiation dosimeters



Getting ready

January 2024 – May 2024

This period has been eventful in its own way for MeLiDos, as all partners are getting to finally get started with device characterisation and data collection. The first paper from the consortium has been accepted for publication and summarizes current challenges in light dosimetry and the project's goals. (<https://doi.org/10.1016/j.measurement.2024.114909>)

Update on device characterisation

First, we finally have devices to work with! Partners in characterisation laboratories have received some of the planned light loggers to characterise, while some are still under way. Solar UV dosimeters are expected for this summer from our three collaborators from around the world. This will come at the right time as the first part of WP1 is coming to a close with a set of characterisation to be carried out on the devices.

The arrival of light loggers also marked the start of data analysis methods for WP3. The WP3 team had already investigated several sensors or devices that could be used to collect spatially resolved light logging data (2D logging). It is now able to work on methods to extract relevant metrics from this 2D logging data and cross check with point measurements from classical light loggers.

Towards building a Proof of Concept for a 2D light logger

Following a survey and discussions with light logger users, the team worked out a list of specifications for 2D light logger. Details on this study are available on the website as a [news article](#).

The main focus of the team in recent months has been to figure out a way to render light logging data from matrix sensors in a way that does not, seemingly or actually infringe on data privacy. Several similar use cases have been investigated, including dash cams and machine vision.

Activity reports are being finalised and stakeholders can contact the project's coordinator or Work Package 3 leader through the website for additional information.

Getting ready for field data collection

As part of Work Package 2, we set out to collect an extensive personal light exposure dataset from a European cohort across four consortium partners in Spain, Sweden, the Netherlands, and Germany. We are thrilled to announce that our team has been enriched with the addition of partners in Turkey (led by Altug Didikoglu from Izmir Institute of Technology) and Ghana (led by Kwadwo Owusu Akuffo from Kwame Nkrumah University of Science and Technology). Their involvement in the MeLiDos project as collaborators and their active participation in data collection is expected to bring a significant positive impact on our project.

All the consortium members have already received the dosimeters ActLumus from Condor Instruments, which has been selected for this data collection campaign after careful consideration. We have also 3D printed spectacle frames in two sizes for the test subjects to wear and collect data at the eye level.



Light loggers, their docking station and wrist straps (left), and 3D printed frames (right)

Preparations for the data collection are in full swing. With the finished experimental protocol (preprint [here](#)) and the approval of ethics from the Technical University of Munich, the project partners are far along to finishing translation work, local ethics approval, and pilot tests.

Ethical approvals and questionnaires are almost finalized. A debate about the best dates to schedule the data collection campaign was held between the participants, in order to get the most representative data set taking into account the multiple locations, which concluded in dates around the equinox. The study is now on track to start with data collection this fall.

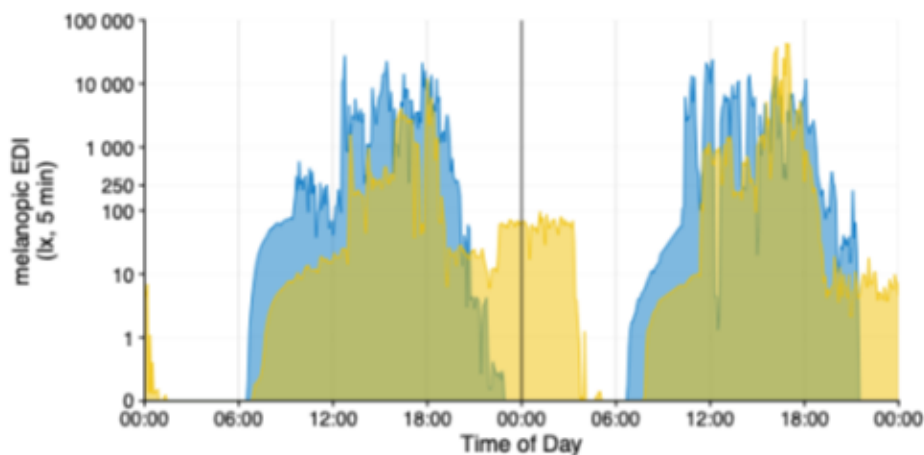
LightLogR featured by Euramet



We have the pleasure to announce that LightLogR has been selected to be featured in a “News story” by Euramet on their website. The story has [been published on June 26th](#) and it includes exclusive quotes from its developers and the project coordinator.

Development of the software package LightLogR has proceeded strongly since the last Newsletter. A major milestone has been the inclusion of all major metrics used for personal light exposure analysis, such as time above threshold, brightest/darkest hours of the day, and many more, made possible by the addition of Steffen Hartmeyer from EPFL as a contributor to the software package! LightLogR is available in Version 0.3.6 [here](#). Further, LightLogR is now archived on [Zenodo](#), making it citable through doi, and is now listed in the [“Research Resource Identification Portal”](#) (RRID).

LightLogR is also available through [CRAN](#), the comprehensive R archive network, which makes installation a breeze



First time above 250 lx mel EDI	09:40	13:05
Duration above 250 lx mel EDI	08:15	04:15
Average mel EDI	1 635 lx	334 lx
Light Exposure mel EDI	39 klx·h	8 klx·h
Brightest 10h mean mel EDI	3 908 lx	791 lx
Brightest 10h midpoint	14:45	17:55

We have great ideas in the pipeline for future features, but we are also very eager to learn what is important for you when analyzing personal light exposure data. You can help to shape the future of LightLogR and have the chance to win a prize while you are at it. We prepared this [short survey](#) (~15 minutes) to help us decide on the most relevant and impactful aspects to work on next.

The project's dissemination activities

January 2024 – May 2024

The **activities** by the members of the MeLiDos consortium keep making visible the objectives:

January 2024	
https://www.euramet.org/technical-committees/tc-pr	LNE presented the Project and its early work at the EURAMET TC-PR Annual Meeting in Istanbul
February 2024	
	TUM presented the Oral Communication " <i>Personal Light Exposure and Health in Real-world Settings: Connecting the Dots Through Wearable Technology</i> " at the International Forum Optica Incubator on wearable dosimeters and light loggers
	FUSP-CEU presented the Oral Communication " <i>MeLiDos project: metrology for portable light recorders and optical radiation dosimeters. Progress in the development of the project.</i> " at the Annual congress of the Spanish Group of Photobiology (GEF)
April 2024	
	SFI Davos presented the Oral Communication " <i>Traceability and quality of UV measurements from solar radiation networks</i> " in the Nordic Ozone Group Meeting
	TUM presented the Oral Communication " <i>MeLiDos: Standards in der tragbaren Lichtmesstechnik für melanopische Lichtwirkungen</i> " at the BAuA Symposium on light and health; Dortmund

May 2024	
	FUSPCEU presented the Oral Communication “MeLiDos project: metrology for portable light recorders and optical radiation dosimeters. Progress in the development of the project”. at the Annual congress of the Spanish Committee of Illumination (CEI)

The MeLiDos consortium continues, through multiple members, to work closely with the interdivisional joint Technical Committee JTC 20 (JTC between CIE D6 [lead] and D2 [co-lead]) on Wearable optic dosimetry and light logging methods, limitations, device calibration and data schemes.

Reference readings:

Several communications and papers have been shared in Congresses by the different members

Manuel Spitschan, Johannes Zauner, Maria Nilsson Tengelin, Constantinos A. Bouroussis, Patrik Caspar, Fabien Eloi. Illuminating the future of wearable light metrology: Overview of the MeLiDos Project. *Measurement*. Volume 235. 2024. 114909. ISSN 0263-2241. <https://doi.org/10.1016/j.measurement.2024.114909>

Upcoming events

- The midterm meeting of meeting of the MeLiDos group will take place in Bern, hosted by METAS, in November.
- In 2025, the MeLiDos consortium will present their work at the CIE midterm conference in Vienna, Austria and at the International Congress of Metrology in Lyon, France.

Acknowledgements:

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or EURAMET. Neither the European Union nor the granting authority can be held responsible for them.

**EUROPEAN
PARTNERSHIP**



**Co-funded by
the European Union**

The project has received funding from the European Partnership on Metrology, co-financed from the European Union's Horizon Europe Research and Innovation Programme and by the Participating States.

**METROLOGY
PARTNERSHIP**

