

Predicting the long-term tolerance of functional materials for use in extreme radiation conditions

Version 1

Description

This Data Management Plan (DMP) supports the project “Predicting the long-term tolerance of functional materials for use in extreme radiation conditions” (LZP-2023/1-0453) funded by the Latvian Council of Science. The project focuses on understanding and predicting radiation damage and thermal annealing behavior in advanced optical and scintillator materials exposed to various types of high-dose radiation (gamma, proton, neutron, ion). The DMP outlines how data collected during experimental and theoretical investigations—such as spectroscopic measurements (optical, EPR, Raman), irradiation results, and simulation outputs—will be handled according to FAIR principles. The purpose of this DMP is to ensure that all research data are managed responsibly, stored securely, shared appropriately, and made openly available when possible via repositories such as Zenodo. This will support reproducibility, transparency, and long-term usability of the results. Project leader Dr.phys. Anatolijs Popovs. Project duration: 01.01.2024 - 31.12.2026. Total funding: 300 000 EUR.

Funder

Latvian Council of Science

Grant

Predicting the long-term tolerance of functional materials for use in extreme radiation conditions
(lcs_____::lzp-2023/1-0453)

Researchers

Marina Konuhova (0000-0003-0743-5915), Anatoli I. Popov (0000-0003-2795-9361)

Organizations

Institute of Solid State Physic, University of Latvia

1. Main Info

Title of DMP: Predicting the long-term tolerance of functional materials for use in extreme radiation conditions

Description:

This Data Management Plan (DMP) supports the project “Predicting the long-term tolerance of functional materials for use in extreme radiation conditions” (LZP-2023/1-0453) funded by the Latvian Council of Science. The project focuses on understanding and predicting radiation damage and thermal annealing behavior in advanced optical and scintillator materials exposed to various types of high-dose radiation (gamma, proton, neutron, ion). The DMP outlines how data collected during experimental and theoretical investigations—such as spectroscopic measurements (optical, EPR, Raman), irradiation results, and simulation outputs—will be handled according to FAIR principles. The purpose of this DMP is to ensure that all research data are managed responsibly, stored securely, shared appropriately, and made openly available when possible via repositories such as Zenodo. This will support reproducibility, transparency, and long-term usability of the results. Project leader Dr.phys. Anatolijs Popovs. Project duration: 01.01.2024 - 31.12.2026. Total funding: 300 000 EUR.

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2. Funding

Funding organizations: Latvian Council of Science

Grants: Predicting the long-term tolerance of functional materials for use in extreme radiation conditions (lcs_____:lzp-2023/1-0453)

Project:

3. License

License:

Access Rights: [Public](#)

Publication Date:

4. Templates

Descriptions

LCS FARP

Template: [LCS FARP](#)

Type: [Dataset](#)

1 Data Summary

1.1 Data Summary

1.1.1 What is the purpose of the data collection/generation?

The purpose of the data collection is to study the behavior of scintillating and optical materials under high-dose radiation and thermal annealing conditions. The generated data include luminescence spectra, structural changes, and defect evolution under gamma, neutron, proton, and ion irradiation. These data support the development of predictive models for material performance and radiation tolerance. Some datasets are also presented in peer-reviewed publications in PDF format to ensure traceability and scientific validation.

1.1.2 Type of data generated/collected

- Experimental data
- Other

Scientific articles in PDF format will also be included when they contain original datasets generated within the project. These will be stored in Zenodo alongside raw data where applicable.

1.1.3 Format of data generated/collected

- PDF
- Others

PDF (peer-reviewed publications containing structured experimental results and analysis)

1.1.4 Expected size of the data – give expected size and choose unit of measurement

500

MB

1.1.5 Are you re-using this data set?

No

1.1.6 If No, please describe, if you have considered re-using any of existing data?

The data collected in this project are entirely new and generated from original experiments conducted on optical and scintillating materials under various radiation exposures.

1.1.8 To whom the data might be useful ("data utility")? Other relevant remarks)

The data generated in this project may be useful to researchers in materials science, radiation physics, and solid-state physics, especially those working on the development of radiation-tolerant materials. The datasets can serve as reference for experimental validation, modeling, or benchmarking of radiation effects in optical and scintillator materials.

2 Research Data Management

2.1 Metadata and documentation

2.1.1 Will data be attributed with standard identification mechanism (e.g. persistent and unique identifiers such as Digital Object Identifiers – DOI)?

Yes

DOI

2.1.2 Do you plan to provide metadata for your data?

Yes

2.1.3 Will you use any metadata standard?

Yes

DataCite Metadata Schema

2.1.4 Will search keywords be provided that optimize possibilities for re-use?

Yes

Basic domain-specific terms

2.1.5 Will you follow any naming conventions for keywords?

Yes

Plain English terms, consistent spelling

2.1.6 Will you provide clear version numbers?

Yes

2.2 Making data openly accessible

2.2.1 What type of access the data generated/produced will have (choose one)?

open (anyone is able to access data without restrictions)

2.2.2 Will you apply embargo period to access for your data?

No

2.2.3 Will data, associated metadata, documentation and code be made accessible with means of a repository?

Yes

Zenodo

<https://zenodo.org/>

2.2.4 What methods or software tools are needed to access the data?

Most of the data will be accessible in common formats such as PDF, CSV, or image files, which require no specialized software. However, for raw spectroscopy or simulation data, specialized tools like OriginLab, MATLAB, or Python with specific libraries may be required.

2.2.5 Will documentation about the software needed to access the data included?

No

2.2.6 Is it possible to include the relevant software (e.g. in open source code)?

No

2.2.7 Other relevant remarks

No specific software is required for general data access; files will be provided in readable formats (e.g., PDF, CSV).

2.3 Making data interoperable

2.3.1 Are the formats open to software applications and to recombination with different data sets?

Yes

Most data will be shared in open or widely supported formats such as CSV, TXT, PNG, or PDF. These formats are compatible with standard software tools and allow reuse, combination, and long-term accessibility.

2.3.2 Will you use data standard vocabulary/taxonomy to make your data interoperable?

No

2.4 Increase data re-use

2.4.2 Are the data usable by third parties, in particular after the end of the project?

Yes

The data will be publicly available on Zenodo and can be reused by third parties with proper citation.

2.4.4 How long is it intended that the data remains re-usable?

2035-12-31

Data will be available for at least 10 years.

2.4.5 Are data quality assurance processes provided?

Yes

2.4.6 Other relevant remarks

Data will be published only after verification and validation by the research team.

3 Resources and Security

3.1 Allocation of resources

3.1.2 Who will be responsible for data management in your project?

- Anatoli I. Popov (0000-0003-2795-9361)
- Marina Konuhova (0000-0003-0743-5915)

3.3 Ethical aspects

3.3.1 Are there any ethical or legal issues that could have an impact on data collection and sharing?

No

3.3.2 Have you got/will you get permission from ethics committee to collect and process data (if applicable)?

No

3.3.3 Is informed consent for data sharing and long term preservation included in questionnaires dealing with personal data, if applicable?

No

3.3.4 Will data collected/generated include personal data/ sensitive information?

No

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