

MOBILITY MISSION REPORT

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REPORT TEMPLATE GUIDELINES – REMOVE THIS ENTIRE SECTION BEFORE SUBMITTING

- *This template consists of “sections” (fixed headings) and “fields” (text boxes for custom information)*
- *All sections and fields are mandatory unless specified otherwise*
- *Appendix “A. Mission journal” should be prepared during the course of the mission*
- *All template guidelines shall be replaced with custom text or removed as specified*
- *The report shall be approved by the official mission mentors or supervisors before submission (use the signature block at the very end of the report template)*
- *The report shall be submitted in both editable (.doc) and portable (.pdf) file formats*
- *Both files shall use the code of the mission as the filename’s suffix, i.e. “Mission_Report_SXXXXX” : the word “Template” shall be replaced with the initial code assigned automatically to the application (letter “S” followed by 5 digits)*
- *The report shall be submitted via email to euradwp13@sckcen.be*

MISSION TITLE

EURAD final event

DESCRIPTION

Concerned organisations

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- Research entities
- Waste management organisations

My organization Technical University of Liberec, participates under Czech WMO : SÚRAO.

Concerned infrastructures or facilities

- High-performance computing

The mobility action was related to results using HPC.

Concerned phases

This field does not apply because no facility is going to be constructed. The aim of this mobility mission report is to emphasize what I have learned in the eurad annual event taking place at Bucharest, Romania.

Themes and topics

- Theme 4: Geoscience to understand rock properties, radionuclide transport and long-term geological evolution
 - Aqueous pathways and radionuclide migration
- Theme 5: Geological disposal facility design and the practicalities of construction, operations and closure
 - Facility and disposal system design
 - Constructability, demonstration and verification testing
 - Health and safety during transport, construction, operations and closure
 - Monitoring and retrievability
- Theme 7: Performance assessment, safety case development, and safety analyses
 - Performance assessment and system models
 - Treatment of uncertainties

Keywords

performance assessment; multilevel Monte Carlo method; Bayes inversion; multifidelity models; surrogates

EXECUTIVE SUMMARY

The talk «UNCERTAINTY QUANTIFICATION AND MULTIFIDELITY TECHNIQUES FOR MECHANICAL AND TRANSPORT PROCESSES IN FRACTURED ROCK »

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delas with acceleration techniques for forward and inverse uncertainty propagation problems demonstrated on practical repository models.

1. MISSION BACKGROUND

1.1. R&D background

1.2. Mission objectives

Presentation of some cutting edge developments of the WP 4 - DONUT.

1.3. Mission request

As I mentioned before the mission request is to attend to the final annual event of EURAD and give a summary talk.

1.4. Mission composition

Host organisation

EURAD final event

Host facility

EURAD, Pullman Hotel, Bucharest (Romania)

Mission dates

April 23rd to 25 th, 2024

2. MAJOR PRACTICES, TECHNIQUES, METHODS, TOOLS OR SYSTEMS OPERATED OR STUDIED

2.1. Practice, technique, method, tool or system operated or studied during the mission

Multilevel Monte Carlo method, Bayes inversion Delayed acceptance

Description

Hierarchy of approximations of a quantity of interest (QoI) is used to reduce the variance of a Monte Carlo estimate and significantly reduce computational cost. Similarly multifidelity models are used in Delayed Acceptance Metropolis-Hastings to accelerate inverse uncertainty quantification.

Usage

The methods are applied in a) sensitivity analysis of a transport process b) characterization of the hydraulic and mechanical rock properties from the pore pressure measurements.

Benefits

Enable more exact uncertainty quantification models.

Limitations

Currently the method is not directly applicable to the models involving discrete fracture networks typical for crystalline rock.

Applicability

The methods are applied in a) sensitivity analysis of a transport process b) characterization of the hydraulic and mechanical rock properties from the pore pressure measurements.

3. MISSION FINDINGS AND CONCLUSIONS

3.1. Lessons learned and conclusions

EURAD Final Event provides an excellent opportunity to get overview of the achieved results of various packages and meet with other experts.

3.2. Relevant findings and conclusions for home organisation

3.3. Relevant findings and conclusions for host organisation

3.4. Relevant findings and conclusions for other organisations

4. POTENTIALS FOR IMPROVEMENT OR DEVELOPMENT

4.1. Generic potentials

There is a huge potential for an improvement of the seats of the Hotel Pullman.

4.2. Potentials for home organisation

4.3. Potentials for host organisation

APPENDICES

Mission journal

22.4. travel

23.4. EURAD final event

24.4. EURAD final event , talk

25.4. EURAD final event

26.4. - 28.4. Non-EURAD visit, interrupted

29.4. travel back

Mission bibliography

MISSION BENEFICIARY

Jan Březina
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Czech Republic

PARTNER EXPERTS CONTRIBUTING TO THE MISSION

Host organisation experts

None

Home organisation experts

None

Other organisations experts

None

REPORT APPROVAL

Date	Beneficiary	Home mentor/supervisor	Host mentor/supervisor
25.6.2024	Jan Březina		
			