

102nd Journées Luxembourgeoises de Géodynamique (JLG) & EFEHR Scientific Session 2024

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co-organized by the European Center for Geodynamics and Seismology (ECGS)
and the European Facilities for Earthquake Hazard and Risk (EFEHR)

with the support of **Geo-INQUIRE** **ESC** **ECGS | ECGS**

102ème Journées Luxembourgeoises de Géodynamique (JLG) & EFEHR Scientific Session 2024

Multi-hazard and multi-risk assessment for geohazards

27-29 November 2024, Luxembourg

Many thanks to all participants for a great meeting!

- [Overview & Conveners](#)
- [Programme](#)
- [Venue](#)

Dates: 27-29 November 2024

Location: [Alvisse Parc Hotel](#), Luxembourg

Hosted by: ECGS

General Overview

Risk assessment bridges the geo-hazards to their societal consequences. As such, it constitutes the most outward-facing component in the chain, starting from gathering the data and modeling the phenomenon towards understanding its consequences. This is where models meet reality; and the



reality is invariably complex and multi-risk. In the past decades, the scientific community has established an understanding of single hazards and their direct consequences. However, there is still a lot to explore regarding the complex interactions between hazards and their consequences on society, those situations in which the union is larger than the simple mathematical sum, and where a direct cause and effect pattern can be sometimes difficult to establish.

In this session, we provide a brief outlook through some of the challenges that we face in multi-hazard and multi-risk analysis of geohazards and their consequences. We would like to address questions such as:

- What are the challenges, needs and gaps as seen from the “real world”? What is the point of view of stakeholders and the private sector?
- How can we make the most of multidisciplinary datasets?
- Towards multi-hazard or hazard-agnostic exposure models? Can multi-hazard vulnerabilities be possibly harmonised?
- What is the future of earthquake ground motion models?
- Which are the challenges for time-dependent seismic hazard assessment? Can short-term forecasting become operational?
- How to capture the interactions between slow-onset (e.g., sea-level rise, ageing, heat waves) and fast-onset events (e.g., tsunami, earthquakes, landslides)?
- Cross-cutting: how can Machine learning and AI help us with the above challenges?
- How to communicate our research with a broader audience?

We invite the EFEHR members, as well as researchers, practitioners, policymakers, and anyone passionate about the intersection of AI, Earth Sciences, and societal resilience to geo-hazards to participate in this enlightening and inspiring event.

Conveners

- Laurentiu Danciu (ETH Zurich)
- Adrien Oth (ECGS)
- Fatemeh Jalayer (UC London)

Local Organisers

- Adrien Oth
- Yannick Breh
- Maxime Jaspard
- Gilles Celli

Programme

The full programme of the meeting can be found [here](#).

JLG102 / EFEHR Scientific Session 2024, November 27-29, 2014		
Wednesday, November 27, 2024		
V. Silva (University of Aveiro)	Multi-hazard Exposure Model of GEM	PDF
Gerard O'Reilly (EUCENTRE Foundation)	Built environment data for multi-hazard vulnerability models within EPOS	PDF
Fatemeh Jalayer (UCL)	Multi-hazard vulnerability models within EPOS	
Danijel Schorlemmer (GFZ/ETH)	Every building on Earth!	
Subash Ghimire (ISTerre)	Evaluation of Machine Learning Models for Average Annual Losses Assessment and Comparison with ESRM20 Results in France	PDF
Salvatore Iacchetti (AXA XL)	Modeling earthquake risk and its secondary effects – The (Re)Insurance Industry Perspective and Needs	
Radmila Salic Makreska (Ss. Cyril and Methodius University in Skopje)	UCPM efforts in addressing multi-risk cross-border and multi-country challenges in the Western Balkans through several recent initiatives	PDF
Zuzana Stanton-Geddes (World Bank)	From data to decisions – using data and information for scaling up disaster and climate resilience	PDF
Alexandra Tsioulou (Gallagher RE)	Multi-risk perils: The view, needs and gap from the (re)insurance industry	PDF
Michèle Marti (ETH)	Interactive Communications Session	PDF
Thursday, November 28, 2024		
Susana Custodio (University of Lisbon)	Earthquake processes in Low-Strain Regions, Challenges and Opportunities: An example from West Iberia	PDF
Panagiotis Elias (NOA / University of Patras)	Space geodesy for geohazards assessment and monitoring: Well established applications, new insights and potential	PDF

Leila Mizrahi (ETH)	Towards European Operational Earthquake Forecasting and Time-Dependent Hazard and Risk Assessment	PDF
Francesco Visini (INGV)	Testing Seismic Hazard Models: lessons learned from Italy	PDF
Dino Bindi (GFZ)	From magnitude-distance scaling to the non-ergodic paradigm: the long journey of ground motion models	PDF
Chiara Smerzini (Politecnico di Milano)	Physics-based numerical simulations: recent advances and challenges of a new frontier for earthquake ground motion prediction	PDF
Filippo Gatti (CentraleSupélec)	Generative strategies to empower physics-based wave propagation with deep learning	PDF
Carlos Molina Hutt (Univ. British Columbia)	Utilization of earthquake-induced ground motions in engineering practice and risk analysis	PDF
Friday, November 29, 2024		
Carlo Meletti (INGV)	The legacy of MPS19, the “useless” Italian hazard model	PDF
Antonio A. Correia (LNEC)	Increasing Earthquake Resilience In Almada, Portugal. Seismic Risk Assessment And Communication	
Andrea Rovida (INGV), Roberto Basili (INGV), Laurentiu Danciu (ETH)	GeoINQUIRE Multi-hazard, Multi-risk services: hands-on session	
Posters		
Pasquale, Cito, and Iunio Iervolino	Drivers to seismic hazard curve slope.	
Melissianos, V.E., D. Vamvatsikos, L. Danciu and R. Basili	Design displacement for lifelines at fault crossings: the code-based approach for Europe	PDF
Galasso, Carmine, Kenneth Otarola, Leandro Iannacone and Roberto Gentile	Multi-hazard life-cycle consequence analysis of engineering systems	
Vacareanu, Radu and Viorel Popa	Seismic risk mitigation strategy of Romania	

Gatti, Filippo, Fanny Lehmann, Hugo Gabrielidis, Michaël Bertin, and Didier Clouteau	Fault-to-site data-enhanced high-fidelity earthquake simulator for regional ground motion prediction	
Akinci, Aybige, Arben Pitarka and Pietro Artale Harris	Comparing 1D/3D ground motion simulations for earthquakes in Central Italy	
Manea, E. F., L. Danciu, C.O. Cioflan, D. Toma-Danila and M. Gerstenberger	Testing the 2020 European seismic hazard model in Romania	
Vanneste, Kris and Mahsa Onvani	The BELSHAKE database of earthquake ground motion in Belgium	PDF
Onvani, Mahsa and Kris Vanneste	Kappa computation and evaluation for the BELSHAKE dataset	
Masson, Frédéric and the ATTS and Alceste teams	Seismic hazard and risk activities within Epos-France and progress on the Alceste project	
Grajčevci, Florim and Labeat Misini	Seismic hazard of Kosovo	PDF
Grajčevci, Florim and Labeat Misini	A targeted seismic upgrading method for precast roof-beam columns connections using adaptable seismic safety key devices	PDF
Xhahysa, A., N.Kuka, M.Pagani and K.Bayliss	National seismic hazard model of Albania	PDF
Pandolfi, Claudia, Matteo Taroni, Rita de Nardis, Giusy Lavecchia, and Aybige Akinci	Unveiling Seismic Hazard Merging Geophysical and Catalog-based Data into a 3D Seismic Rate Model: a Case Study from the Adriatic Thrust Zone (Italy)	PDF
Gabrielli, Simona, Aybige Akinci and Edoardo Del Pezzo	Unveiling Seismic Hazard Merging Investigating the impact of attenuation variations on ground motion models in Central Italy	

Venue and Practical Aspects