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Mathieu Causse

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Gender: Male **Date of birth:** 18/10/1981 **Nationality:** French

ABOUT MYSELF

I am a researcher in the field of seismology and seismic hazard assessment in the research team "Geophysics of seismic and gravitational hazard" of the ISTerre laboratory. My aim is to understand the physical phenomena that control the ground motion generated during earthquakes, in order to better predict their effects. I also work on earthquake engineering applications. My main research interests include the physics of earthquake rupture process and the simulation of strong ground motion.

WORK EXPERIENCE

ISTerre, Univ. Gustave Eiffel

City: Grenoble | **Country:** France

[2011 – Current] **Senior Researcher in seismology**

Student supervision

- 2024-2027: H. AlJamal, "Comprehensive seismic damage predictions at building scale in Beirut for a large magnitude earthquake on the Mount Lebanon thrust fault", PhD, Univ. Grenoble Alpes (Co-advisor)
- 2023-2026: H.Su, "Near-fault ground motion prediction, site effects and wave propagation at regional scale for a shallow earthquake in southeastern France", PhD, Univ. Grenoble Alpes (main advisor)
- 2023-2026: J.Karashi, "Spatial and temporal diversity of rupture characteristics and impact on ground-motion predictions for earthquake sequences", PhD, Univ. Grenoble Alpes (main advisor)
- 2021-2024: I. Loncar, "Source analysis of the 2020 M 6.4 Petrinja (Croatia) earthquake", PhD, University of Zagreb (co-advisor)
- 2015-2018: R. Fayjaloum, “Strong Ground Motion Prediction in the Near-Nield”, PhD, Univ. Grenoble Alpes (co-advisor)
- 2012-2015: A. Dujardin , “Ground-Motion Prediction at a Specific Site Using Small Earthquakes”, PhD, Univ. Nice Sophia Antipolis (co-advisor)
- Since 2011, supervison of ~10 M.Sc. internships

Main research projects

- UGA-PITASIS 2023-2024,The potential of grave slabs to assess near-fault seismic hazard, coordinator
- INSU-SHCROCO 2022-2023, Seismic Hazard in Croatia: a collaborative approach, participant
- INSU-FREMTEIL 2021-2023, Seismic Hazard Assessment in the Le Teil area (Rhone valley, France): a collaborative approach, participant
- Sism@lp-SWARM 2019-2021, Analysis of seismic swarms in France, participant
- ANR-SINAPS 2018-2021, Numerical Ground Motion Prediction in CEA-Cadarache (southeast France), participant
- UGA-CORRESP 2016-2017, Correlation of earthquake rupture parameters, coordinator
- INSU-AMARETI 2018, Analysis of the 2016-2017 Amatrice-Norica (Central Italy) seismic sequence, coordinator
- IRD-SAMMOVA 2015-2018, Seismic Hazard Assessment in Lebanon, participant
- EDF-SIGMA 2012-2015, Seismic Hazard Assessment in France, participant
- EU-NERA 2010-2014, Physics-based ground motion prediction, participant
- Head of the French Permanent Accelerometric Network, 2012-2013

Teaching

I teach seismology and seismic hazard at Univ. Grenoble Alpes (MSc. Natural Geological Hazards and Risks, Polytech Grenoble Engineering School) and University of Strasbourg (~40 hours/yr)

EDUCATION AND TRAINING

[2024] **Habilitation à Diriger des Recherches**

Univ. Grenoble Alpes https://hal.science/tel-04993519

Country: France |

[2005 – 2009] **PhD, Earth and Environmental Sciences, "Blind Prediction of Ground Motion"**

Univ. Grenoble Alpes https://www.univ-grenoble-alpes.fr/

Country: France |

[2010] **Postoctoral researcher, "Earthquake source characterization"**

King Abdullah University of Science and Technology https://www.kaust.edu.sa/

Country: Saudi Arabia |

PUBLICATIONS

[2025] **The extremely shallow MW 4.9 2019 Le Teil earthquake, France: main ground motion features and comparison with ground motion models**

Reference: Laurendeau, A., M. Causse et al., Seismica

[2025] **High stress drop and slow rupture during the 2020 MW6.4 intraplate Petrinja Earthquake, Croatia**

Reference: Žilić, I., Causse, M., Vallée, M., & Markušić, S. (2025), Journal of Geophysical Research : Solid Earth, 130, e2024JB029107

[2025] **The i-FSC proxy for predicting inter-event and spatial variation of topographic site effects**

Reference: Bou Nassif, A., Maufroy, E., Lacroix, P., Chaljub, E., Causse, M., & Bard, P. Y., Bulletin of Earthquake Engineering, 23(2), 671-692.

[2024] **Analyzing 50 years of the Lacq induced seismicity (SouthWestern, France) highlights the role of fluid injection**

Reference: Letort et al., Geophys. J. Int., 238, 214-234

[2023] **Blind broad-band (0–10 Hz) numerical prediction of the 3-D near field seismic response of an M W6. 0 extended fault scenario : application to the nuclear site of Cadarache (France).**

Reference: Castro-Cruz, D. et al., Geophysical Journal International, 232(1), 581-600.

[2023] **What Was the Level of Ground Motion across Europe during the Great AD 365 Crete Earthquake ?**

Reference: Causse, M., Maufroy, E., André, L., & Bard, P. Y., Seismol. Res. Letters, 94(5), 2397-2410.

[2021] **Exceptional Ground Acceleration during the shallow Mw4.9 Le Teil earthquake, France**

Reference: Causse, M. et al., Communciations Earth and Environment,2(1),14.

[2021] **Sensitivity Analysis of the Interfrequency Correlation of Synthetic Ground Motions to Pseudodynamic Source Models**

Reference: Song, S.G., M. Causse and J. Bayless, Seismol. Res. Lett, doi:10.1785/0220200181.

[2020] **Seismic stereometry reveals preparatory behavior and source kinematics of intermediate-size earthquakes**

Reference: Mordret, A., Brenguier, F., Causse et al.., Geophy. Res. Lett., 47(17), e2020GL088563