

Curriculum vitae

Benoit Derode

FCFM, University of Chile
D.G.F., Geophysics Department
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Citizenship: French
Born: November 30, 1985

Current Position: Post-Doctoral Position in Geophysics (Intermediate-Depth Earthquakes)

Research Interests:

- Experimental investigation of subsurface seismo-hydromechanical processes
- Processes at the interface between hydrogeophysics, rock mechanics and seismology
- Signal processing and numerical modeling of dynamic processes
- Unusual Earthquake Sources: On the impact of fluids on the deep earthquakes nucleation

Research Experience:

- 2014 – Now Geophysics Department, FCFM, University of Chile, Chile
Post-Doc in seismology. Team Leader: Jaime Campos
- Intermediate-Depth Earthquakes Nucleation Processes
 - Massive Seismic Analysis
 - Unusual Seismic signal processing
 - Impact of fluids on the deep rupture dynamic.
- 2010 – 2013 Geoazur, Nice-sophia Antipolis University (UNSA), France
Ph.D. in geophysics. Advisor: Frederic Cappa and Yves Guglielmi
“*In-situ* experimental study of the seismic signatures of the role of fluids in the rupture of fault zones”
- Numerical modeling of hydromechanical coupling
 - Unusual Seismic signal processing
- 2009 Geoazur, Nice-sophia Antipolis University (UNSA), France
Internship in geophysics. Advisor: Prof. Guust Nolet
- Theoretical approach of finite frequency tomography
 - Comparison between Born and Rytov approximation for the resolution of the wave equation
- 2008 LGIT (ISTERRE), Grenoble University (UJF), France
Internship in geophysics. Advisor: Prof. F. Renard and C. Voisin
- Analysis of the evolution of contact area function of the rugosity and of the strength evolution
- 2007 LGIT (ISTERRE), Grenoble University (UJF), France
Internship in geophysics. Advisor: Prof. F. Renard and C. Voisin
- Experimental study of strength evolution and dynamic of contacts of a frictional interface

Education:

Jul. 2013 Geoazur, Nice-sophia Antipolis University (UNSA), France
Ph.D in Geophysics, with honors

- Jul. 2009 Geoazur, Nice-sophia Antipolis University (UNSA), France
M.Sc. in Geophysics, with honors
- Jul. 2008 Geoazur, Nice-sophia Antipolis University (UNSA), France
First year of M.Sc. in Geophysics, with honors
- Jul. 2007 LGIT, Grenoble University (UJF), France
First year of M.Sc. in Fundamental Physics
- Jul. 2006 UFR sciences et techniques, Dijon University (UB), France
B.Sc. In Fundamental Physics

Teaching Experience:

- 2014 Geophysics Department, FCFM, University of Chile, Chile
Teaching assistant, Department of Geosciences
- Introduction to near-field seismic inversion (M.Sc. students)
 - Computing with FMNEAR code (M.Sc. students)
- 2012 – 2013 Geoazur, Nice-Sophia Antipolis University (UNSA), France
Temporary teaching position, Department of Earth Sciences
- Introduction to geosciences (35h, B.Sc. students)
 - Informatics: Matlab (16h, B.Sc. students)
 - Plate tectonics (20h, B.Sc. students)
 - Intern Earth dynamic, thermodynamic (20h, M. Sc. students)
- 2010 – 2012 Geoazur, Nice-Sophia Antipolis University (UNSA), France
Teaching assistant, Department of Earth Sciences
- Geosciences: Gravimetry, seismology, etc. (20h, B.Sc. students)
 - Physics, Structural and Earth dynamic (20h, B.Sc. students)
- 2011 – 2012 Geoazur, Nice-Sophia Antipolis University (UNSA), France
Deleguate of the Geoazur laboratory for the annual Science Fair

Field Experience:

- 2009 – 2012 Geology and geophysics of the Low Noise Underground Laboratory of Rustrel (LSBB)

Computer skills & tools:

- Programming: Matlab, Python, C++, Fish, Fortran, Unix, Shell
- Seismic Pre- and Post-Processing: SEED files, SAC, Seiscomp
- Hardwares: FLAC, Particule Flow Code (PFC) 2/3D , from Itasca inc.

Languages:

- French (Mother tongue)
- English (Upper-intermediate)
- Spanish (Professional requirements)

Publications (peer review):

- **Derode B.** and De Barros L., (2015). *In-situ* passive seismic monitoring of fluid flow through a stress deforming unsaturated natural fracture. *Geophys. J. Int.*, *submitted*
- **Derode B.**, Guglielmi Y., De Barros L. and Cappa F., (2015). Seismic response to fluid pressure perturbations in a slipping fault, *Geophys. Res. Lett.* **42**, pp. 3197-3203.
Doi: [10.1002/2015GL063671](https://doi.org/10.1002/2015GL063671)
- **Derode B.**, Cappa F., Guglielmi Y. and Rutqvist J., (2013). Coupled seismo-hydromechanical monitoring of inelastic effects on injection-induced fracture permeability. *Int. J. Rock. Mech. Min. Sci.* **61**, pp. 266-274. Doi: [10.1016/j.ijrmms.2013.03.008](https://doi.org/10.1016/j.ijrmms.2013.03.008)
- **Derode B.**, Guglielmi Y., Cappa F., Gaffet S., and Monfret T., (2011). Seismicity and hydromechanical behavior of a fractured porous rock under a high pressure fluid injection. *EDP Sciences*.
Doi: [10.1051/idust/201101003](https://doi.org/10.1051/idust/201101003)

Other Publications (peer reviewed Extended Abstracts and Invited Papers):

- Guglielmi Y., Henry P., Cappa F., **Derode B.**, (2013). Relationships between slow slip, seismicity and fluids leakage during a pressurized fault zone rupture in-situ experiment: importance for reservoir/caprock stimulation monitoring and efficiency assessment. *47th U.S. Rock Mechanics Symposium*. Id: ARMA 13-517
- **Derode B.**, Cappa F., Guglielmi Y., (2012). Coupled seismo-hydromechanical monitoring of inelastic effects on injection-induced fracture permeability. *74th EAGE Conf. & Exhib. – Workshops, Extended abstract*.
- **Derode B.**, Cappa F., Guglielmi Y., Gaffet S., Monfret T., (2012). Seismicity triggered by stress transfer from a fluid injection-induced fracture activation. *2012 i-DUST Conference, Extended abstract*.

Referees:

- J. Campos Associate Professor, DGF, U-Chile
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- F. Cappa Professor, GEOAZUR, UNSA
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- G. Nolet Professor, GEOAZUR, UNSA
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- J. Virieux CNRS Researcher, ISTERre, UJF
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- C. Voisin CNRS Researcher, ISTERre, UJF
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