

**P D D R . M A R C E L F R E H N E R**

GEOLOGICAL INSTITUTE  
ETH ZURICH, SWITZERLAND

**SUBMITTED AND ACCEPTED PUBLICATIONS**

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Submitted:

Barnhoorn A., Verheij J., Frehner M., Zhubayev A. and Houben M.: **Identification of the transition from elasticity to inelasticity from seismic attenuation analyses**, submitted to Geophysics

Shih P.-J.R. and Frehner M.: **Evidence of Krauklis wave resonance in fractured Westerly granite, Carrara marble, and Fontainebleau sandstone**, submitted to Geophysics

In press:

Lupi M., Frehner M., Weis P., Saenger E.H., Tisato N., Geiger S., Chiodini G., Skelton A. and Driesner T.: **Delayed fluid-driven ground uplift triggered by regional earthquakes at Campi Flegrei**, accepted by Earth and Planetary Science Letters

**PEER-REVIEWED PUBLICATIONS**

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(LISTED IN ISI WEB OF SCIENCE CORE COLLECTION)

- 2017 Nabavi S.T., Alavi S.A., Mohammadi S., Ghassemi M.R. and Frehner M., 2017: **Analysis of transpression within contractional fault steps using finite-element method**, Journal of Structural Geology 96, 1–20, doi:10.1016/j.jsg.2017.01.004
- von Däniken P.A. and Frehner M., 2017: **3D structural model and kinematic interpretation of the Panixer Pass Transverse Zone (Infrahelvetic Complex, eastern Switzerland)**, Swiss Journal of Geosciences 110, 653–675, doi:10.1007/s00015-016-0230-7
- 2016 Bakker R.R., Frehner M. and Lupi M., 2016: **How temperature-dependent elasticity alters host rock/magmatic reservoir models: A case study on the effects of ice-cap unloading on shallow volcanic systems**, Earth and Planetary Science Letters 456, 16–25, doi:10.1016/j.epsl.2016.09.039
- Frehner M., 2016: **3D fold growth in transpression**, Tectonophysics 693, 183–196, doi:10.1016/j.tecto.2016.01.002
- Frehner M., 2016: **Paul Niggli Medal 2015 awarded to Marcel Frehner**, Swiss Journal of Geosciences 109, 117–119, doi:10.1007/s00015-016-0213-8
- Frehner M. and Schmid T., 2016: **Parasitic folds with wrong vergence: How pre-existing geometrical asymmetries can be inherited during multilayer buckle folding**, Journal of Structural Geology 87, 19–29, doi:10.1016/j.jsg.2016.04.004
- Shih P.-J.R. and Frehner M., 2016: **Laboratory evidence for Krauklis wave resonance in fractures and implications for seismic coda wave analysis**, Geophysics 81, T285–T293, doi:10.1190/GEO2016-0067.1
- 2015 Frehner M., Ling A.H.M. and Gärtner-Roer I., 2015: **Furrow-and-ridge morphology on rockglaciers explained by gravity-driven buckle folding: A case study from the Murtèl rockglacier (Switzerland)**, Permafrost and Periglacial Processes 26, 57–66, doi:10.1002/ppp.1831

- Zhong X., Frehner M., Kunze K. and Zappone A.S., 2015: **A numerical and experimental investigation on seismic anisotropy of Finero Peridotite, Ivrea-Verbano Zone, northern Italy**, in *Materials Science and Engineering* (Eds: Skrotzki W. and Oertel C.-G.), Volume 82 of IOP Conference Series, IOP Science and Publishing, 012072, doi:0.1088/1757-899X/82/1/012072 (open access)
- 2014 Frehner M., 2014: **3D fold growth rates**, *Terra Nova* 26, 417–424, doi:10.1111/ter.12116
- Frehner M., 2014: **Krauklis wave initiation in fluid-filled fractures by seismic body waves**, *Geophysics* 79, T27–T35, doi:10.1190/GEO2013-0093.1
- Frehner M. and Exner U., 2014: **Strain and foliation refraction patterns around buckle folds**, in *Deformation Structures and Processes within the Continental Crust* (Eds: Llana-Fúnez S., Marcos A. and Bastida F.), Volume 394 of Geological Society, London, Special Publications, The Geological Society of London, ISBN 978-1-86239-627-2, 21–37, doi:10.1144/SP394.4
- Saenger E.H., Madonna C., Frehner M. and Almqvist B.S.G., 2014: **Numerical support of laboratory experiments: Attenuation and velocity estimations**, *Acta Geophysica* 62, 1–11, doi:10.2478/s11600-013-0162-9
- Sala P., Pfiffner O.A. and Frehner M., 2014: **The Alpstein in three dimensions: Fold-and-thrust belt visualization in the Helvetic zone, Switzerland**, *Swiss Journal of Geosciences* 107, 177–195, doi:10.1007/s00015-014-0168-6
- Zhong X., Frehner M., Kunze K. and Zappone A., 2014: **A novel EBSD-based finite-element wave propagation model for investigating seismic anisotropy: Application to Finero Peridotite, Ivrea-Verbano Zone, Northern Italy**, *Geophysical Research Letters* 41, 7105–7114, doi:10.1002/2014GL060490
- 2013 Madonna C., Quintal B., Frehner M., Almqvist B.S.G., Tisato N., Pistone M., Marone F. and Saenger E.H., 2013: **Synchrotron-based X-ray tomographic microscopy for rock microstructure investigations**, *Geophysics* 78, D53–D64, doi:10.1190/GEO2012-0113.1
- Sala P., Frehner M., Tisato N. and Pfiffner O.A., 2013: **Building a three-dimensional near-surface geologic and petrophysical model based on borehole data: A case-study from Chémery, Paris Basin, France**, *AAPG Bulletin* 97, 1303–1324, doi:10.1306/02261312120
- 2012 Burtscher A., Frehner M. and Grasemann B., 2012: **Tectonic geomorphological investigations of antiforms using differential geometry: Permian anticline, northern Iraq**, *AAPG Bulletin* 96, 301–314, doi:10.1306/06141110204
- Frehner M., Reif D. and Grasemann B., 2012: **Mechanical versus kinematical shortening reconstructions of the Zagros High Folded Zone (Kurdistan Region of Iraq)**, *Tectonics* 31, TC3002, doi:10.1029/2011TC003010
- Quintal B., Steeb H., Frehner M., Schmalholz S.M. and Saenger E.H., 2012: **Pore fluid effects on S-wave attenuation caused by wave-induced fluid flow**, *Geophysics* 77, L13–L23, doi:10.1190/GEO2011-0233.1
- Steeb H., Kurzeja P., Frehner M. and Schmalholz S.M., 2012: **Phase velocity dispersion and attenuation of seismic waves due to trapped fluids in residual-saturated porous media**, *Vadose Zone Journal* 11, vzj2011.0121, doi:10.2136/vzj2011.0121 (open access)
- Tuitz C., Exner U., Frehner M. and Grasemann B., 2012: **The impact of ellipsoidal particle shape on pebble breakage in gravel**, *International Journal of Rock Mechanics and Mining Sciences* 54, 70–79, doi:10.1016/j.ijrmms.2012.05.018
- 2011 Frehner M., 2011: **The neutral lines in buckle folds**, *Journal of Structural Geology* 33, 1501–1508, doi:10.1016/j.jsg.2011.07.005

- Frehner M., Exner U., Mancktelow N.S. and Grujic D., 2011: **The not-so-simple effects of boundary conditions on models of simple shear**, *Geology* 39, 719–722, doi:10.1130/G31957.1
- Quintal B., Steeb H., Frehner M. and Schmalholz S.M., 2011: **Quasi-static finite element modeling of seismic attenuation and dispersion due to wave-induced fluid flow in poroelastic media**, *Journal of Geophysical Research* 116, B01201, doi:10.1029/2010JB007475
- 2010 Frehner M. and Schmalholz S.M., 2010: **Finite-element simulations of Stoneley guided-wave reflection and scattering at the tips of fluid-filled fractures**, *Geophysics* 75, T23–T36, doi:10.1190/1.3340361
- Steeb H., Frehner M. and Schmalholz S.M., 2010: **Waves in residual-saturated porous media**, Chapter 19 in *Mechanics of Generalized Continua: One Hundred Years after the Cosserats* (Eds: Maugin G.A. and Metrikine A.V.), Volume 21 of *Advances in Mechanics and Mathematics*, Springer Verlag, ISBN 978-1-4419-5694-1, 179–190
- 2009 Frehner M., Schmalholz S.M. and Podladchikov Y., 2009: **Spectral modification of seismic waves propagating through solids exhibiting a resonance frequency: a 1-D coupled wave propagation-oscillation model**, *Geophysical Journal International* 176, 589–600, doi:10.1111/j.1365-246x.2008.04001.x
- Holzner R., Eschle P., Dangel S., Frehner M., Narayanan C. and Lakehal D., 2009: **Hydrocarbon microtremors interpreted as nonlinear oscillations driven by oceanic background waves**, *Communications in Nonlinear Science and Numerical Simulation* 14, 160–173, doi:10.1016/j.cnsns.2007.06.013
- 2008 Frehner M., Schmalholz S.M., Saenger E.H. and Steeb H., 2008: **Comparison of finite difference and finite element methods for simulating two-dimensional scattering of elastic waves**, *Physics of the Earth and Planetary Interiors* 171, 112–121, doi:10.1016/j.pepi.2008.07.003
- 2006 Frehner M. and Schmalholz S.M., 2006: **Numerical simulations of parasitic folding in multilayers**, *Journal of Structural Geology* 28, 1647–1657, doi:10.1016/j.jsg.2006.05.008

#### **PEER-REVIEWED PUBLICATIONS**

( LISTED IN ISI WEB OF SCIENCE INSPEC )

- 2013 Frehner M., 2013: **Krauklis wave initiation in fluid-filled fractures by a passing body wave**, in *Poromechanics V: Proceedings of the fifth Biot Conference on Poromechanics* (Eds: Hellmich C., Pichler B. and Adam D.), American Society of Civil Engineers, ISBN 978-0-7844-1299-2, 92–100
- Quintal B., Frehner M., Madonna C., Tisato N., Kuteynikova M. and Saenger E.H., 2011: **Integrated numerical and laboratory rock physics applied to seismic characterization of reservoir rocks**, *The Leading Edge* 30, 1360–1367, doi:10.1190/1.3672480
- 2010 Frehner M., Steeb H. and Schmalholz S.M., 2010: **Wave velocity dispersion and attenuation in media exhibiting internal oscillations**, Chapter 24 in *Wave Propagation in Materials for Modern Applications* (Ed: Petrin A.), In-Tech Education and Publishing, ISBN 978-953-7619-65-7, 455–476 (open access)

#### **OTHER REVIEWED PUBLICATIONS**

( NOT LISTED IN ISI WEB OF SCIENCE )

- 2014 Tisato N., Quintal B., Chapman S., Madonna C., Subramaniyan S., Frehner M., Saenger E.H. and Grasselli G., 2014: **Seismic attenuation in partially saturated rocks: recent advances and future directions**, *The Leading Edge* 33, 640–646, doi:10.1190/tle33060640.1

- 2013 Frehner M., 2013: **Photograph of the month**, Journal of Structural Geology 55, 196, doi:10.1016/j.jsg.2012.09.010

## **T H E S E S**

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- 2016 Habilitation Treatise  
Frehner M.: **Computational structural geology and rock physics**, Department of Earth Sciences, ETH Zurich, Switzerland
- 2009 Ph.D. Thesis  
Frehner M.: **Numerical modeling of multiscale wave propagation phenomena in fluid-rock systems**, Geological Institute, ETH Zurich, Switzerland, doi:10.3929/ethz-a-005862023
- 2005 Diploma (MSc) Thesis  
Frehner M.: **Strain distribution of buckled multilayer systems and its influence on the development of asymmetric parasitic folds**, Geological Institute, ETH Zurich, Switzerland, doi:10.3929/ethz-a-005872161

## **I N V I T E D C O N F E R E N C E P R E S E N T A T I O N S**

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- 2015 Swiss Geoscience Meeting, Basel, Switzerland, November 20–21 2015, medal lecture for receiving the Paul Niggli Medal of the Swiss Geological Society and the Swiss Society of Mineralogy and Petrology
- Frehner M.: **3D fold growth in transpression** (oral)
- 2012 Pangeo, Salzburg, Austria, September 17 2012, award lecture for receiving the Otto Ampferer Award of the Austrian Geological Society (ÖGG)
- Frehner M.: **Computational Structural Geology – Examples from combined fold observations and modeling** (oral)

## **E X P A N D E D C O N F E R E N C E A B S T R A C T S**

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- 2015 SEG Annual Meeting, October 18–23 2015, New Orleans LA, USA
- Shih P.-J.R. and Frehner M.: **Laboratory evidence for Krauklis wave resonance in a fracture and implications for seismic coda wave analysis** (oral)
- International Workshop on Rock Physics, April 13–17 2015, Perth, Australia
- Shih P.-J.R. and Frehner M.: **Laboratory evidence for Krauklis wave resonance in fractures** (oral)
- 2014 SEG Annual Meeting, October 26–31 2014, Denver CO, USA
- Frehner M., Shih P.-J.R. and Lupi M.: **Initiation of Krauklis waves by incident seismic body waves: Numerical modeling, laboratory perspectives, and application for fracture-size estimation** (oral)
- GeoMod, August 31 – September 5 2014, Potsdam, Germany
- Frehner M.: **Fold growth rates in 3D buckle folds** (poster)
  - Frehner M., Gärtner-Roer I., and Ling A.H.M.: **Furrow-and-ridge morphology on rockglaciers explained by gravity-driven buckle folding: A case study from the Murtèl rockglacier (Switzerland)** (poster)
- 2013 SEG Annual Meeting, September 22–27 2013, Houston TX, USA
- Madonna C., Frehner M., Tisato N., Saenger E.H., Sell K., Kersten M. and Quintal B.: **Synchrotron-based X-ray tomographic images: Raw data, segmentation techniques, and their influence on estimated rock properties** (oral)
- SBGf International Congress, August 26–29 2013, Rio de Janeiro

- Sell K., Madonna C., Quintal B., Frehner M., Tisato N. and Saenger E.H.: **Synchrotron-based X-ray tomographic images and segmentation techniques to account for effects of grain contacts and micro-cracks on rock properties** (oral)
- EAGE Conference, June 10–13 2013, London, UK
- Madonna C., Quintal B., Frehner M., Almquist B.S.G., Tisato N., Pistone M., Marone F. and Saenger E.H.: **Synchrotron-based X-ray tomographic microscopy for rock physics investigations** (oral)
- 2012 SEG Annual Meeting, November 4–9 2012, Las Vegas NV, USA
- Saenger E.H., Madonna C., Frehner M. and Almquist B.S.G.: **Numerical support of laboratory experiments: Attenuation and velocity estimations** (e-poster)
- EAGE Conference, June 4–7 2012, Copenhagen, Denmark
- Frehner M., Quintal B., Tisato N., Riahi N., Madonna C., Sala P., Kuteynikova M. and Saenger E.H.: **Integrated numerical and laboratory rock physics applied to seismic characterization of reservoir rocks** (oral)
  - Quintal B., Frehner M., Schmalholz S.M., Steeb H. and Saenger E.H.: **Effects of permeability barriers and pore fluids on S-wave attenuation** (oral)
- EAGE Saint Petersburg, April 2–5 2012, Saint Petersburg, Russia
- Korneev V., Goloshubin G., Kashtan B., Bakulin A., Troyan V., Maximov G., Molotkov L., Frehner M., Shapiro S. and Shigapov R.: **Krauklis wave: Half a century after** (oral)
- EAGE Workshop: Applications & Challenges of Rock Physics for Quantitative Geophysical Interpretation, January 15–18 2012, Dubai, United Arab Emirates
- Saenger E.H., Frehner M., Madonna C., Tisato N., Kuteynikova M., Riahi N., Sala P. and Quintal B.: **Integrated numerical and laboratory rock physics applied to seismic characterization of reservoir rocks** (oral)
- 2011 SEG Annual Meeting, September 18–23 2011, San Antonio TX, USA
- Quintal B., Steeb H., Frehner M. and Schmalholz S.M.: **S-wave attenuation caused by wave-induced fluid flow** (oral)
- SBGf International Congress, August 15–18 2011, Rio de Janeiro, Brazil
- Quintal B., Steeb H., Frehner M. and Schmalholz S.M.: **S-wave attenuation caused by wave-induced fluid flow** (oral)
- EAGE Conference, May 23–26 2011, Vienna, Austria
- Quintal B., Steeb H., Frehner M. and Schmalholz S.M.: **Pore fluid effects on seismic P- and S-wave attenuation in rocks with double porosity and patchy saturation** (oral)
- 2010 SEG Annual Meeting, October 17–22 2010, Denver CO, USA
- Quintal B., Steeb H., Frehner M. and Schmalholz S.M.: **Finite element modeling of seismic attenuation due to fluid flow in partially saturated rocks** (oral)
- 2007 SBGf International Congress, November 19–22 2007, Rio de Janeiro, Brazil
- Frehner M., Schmalholz S.M. and Podladchikov Y.: **Low frequency spectral modifications of seismic background noise due to interaction with oscillating fluids entrapped in porous rocks** (oral)
  - Saenger E.H., Steiner B., Schmalholz S.M., Lambert M., Podladchikov Y.Y., Quintal B. and Frehner M.: **Considerations of observed spectral anomalies over hydrocarbon reservoirs generated by microtremors** (oral)
- SEG Annual Meeting, September 23–28 2007, San Antonio TX, USA
- Frehner M., Schmalholz S.M. and Podladchikov Y.: **Interaction of seismic background noise with oscillating pore fluids causes spectral modifications of passive seismic measurements at low frequencies** (oral)
- EAGE Conference, June 11–14 2007, London, UK

- Saenger E.H., Schmalholz S.M., Podladchikov Y., Holzner R., Lambert M., Steiner B., Quintal B. and Frehner M.: **Scientific strategy to explain observed spectral anomalies over hydrocarbon reservoirs generated by microtremors** (oral)
  - Frehner M., Schmalholz S.M., Podladchikov Y. and Holzner R.: **Low frequency modifications of seismic background noise due to interaction with oscillating fluids in porous rocks** (poster)
- 2006 EAGE Workshop: Passive Seismic: Exploration and Monitoring Applications, December 10–13 2006, Dubai, United Arab Emirates
- Frehner M., Schmalholz S.M., Holzner R. and Podladchikov Y.: **Interpretation of hydrocarbon microtremors as pore fluid oscillations driven by ambient seismic noise** (oral)
- SEG Annual Meeting, October 1–6 2006, New Orleans LA, USA
- Holzner R., Eschle P., Frehner M., Schmalholz S.M. and Podladchikov Y.: **Interpretation of hydrocarbon microtremors as nonlinear oscillations driven by oceanic background waves** (poster)
- SICC (Italian Society for Chaos and Complexity) Workshop: Nonlinear dynamical methods and time series analysis, August 30 – September 1 2006, Udine, Italy
- Holzner R., Eschle P., Dewarrat R., Lambert M., Meftahi R., Graf R., Schmalholz S.M., Steiner B., Frehner M., Podladchikov Y. and Narayanan C.: **Interpretation of hydrocarbon microtremors as nonlinear oscillations driven by oceanic background waves** (oral)
- EAGE Conference, June 12–15 2006, Vienna, Austria
- Holzner R., Eschle P., Frehner M., Schmalholz S.M. and Podladchikov Y.: **Hydrocarbon microtremors interpreted as oscillations driven by oceanic background waves** (oral)

## **SHORT CONFERENCE ABSTRACTS**

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- 2017 AK Permafrost, Einsiedeln, Switzerland, February 9–11 2017
- Frehner M., Amschwand D. and Gärtner-Roer I.: **Bestimmung des Blockgletscher-Fliessverhaltens aufgrund von Deformationsdaten und geomorphologischen Indikatoren: Beispiel des Murtèl Blockgletschers (Engadin, Schweiz)** (oral in German)
- 2016 Swiss Geoscience Meeting, Geneva, Switzerland, November 18–19 2016
- Barnhoorn A., Verheij J. and Frehner M.: **Transition from elastic to inelastic deformation identified by seismic attenuation, not seismic velocity** (oral)
  - Frehner M.: **Fold axis rotation during transpressional folding: Insights from numerical modeling and application to the Zagros Simply Folded Belt** (oral)
  - Frehner M., Amschwand D. and Gärtner-Roer I.: **Rockglacier flow law determined from deformation data and geomorphological indicators: An example from the Murtèl rockglacier (Engadin, SE Switzerland)** (oral)
- GeoMod, October 17–20 2016, Montpellier, France
- Frehner M.: **Fold axis rotation during transpressional folding: Insights from numerical modeling and application to the Zagros Simply Folded Belt** (poster)
  - Frehner M. and Schmid T.: **Structural inheritance during multilayer buckle folding: How pre-existing asymmetries result in parasitic folds with wrong vergence** (poster)
- International Conference on Permafrost (ICOP), June 20–24 2016, Potsdam, Germany
- Frehner M., Amschwand D. and Gärtner-Roer I.: **Non-linearity of rockglacier flow law determined from geomorphological observations: A case study from the Murtèl rockglacier (Engadin, SE Switzerland)** (poster)
- EGU General Assembly, April 17–22 2016, Vienna, Austria

- Barnhoorn A., Verheij J., Frehner M., Zhubayev A. and Houben M.: **Transition from elastic to inelastic deformation identified by a change in trend of seismic attenuation, not seismic velocity – A laboratory study** (poster)
  - Frehner M., Amschwand D. and Gärtner-Roer I.: **Non-linear flow law of rockglacier creep determined from geomorphological observations: A case study from the Murtèl rockglacier (Engadin, SE Switzerland)** (poster)
  - Frehner M. and Schmid T.: **Structural inheritance during multilayer buckle folding: How pre-existing asymmetries result in parasitic folds with wrong vergence** (PICO)
  - Frehner M. and Schreurs G.: **Fold axis rotation during transpressional folding: Insights from analog and numerical models** (PICO)
  - Frehner M. and von Däniken P.: **3D structural model and kinematic interpretation of the Panixer Pass Transverse Fold (Infralhelvetic Complex, eastern Switzerland)** (poster)
- 2015 Swiss Geoscience Meeting, Basel, Switzerland, November 20–21 2015
- Schmid T. and Frehner M.: **Parasitic folds with wrong vergence: How asymmetries can be inherited** (poster)
  - Shih P.-J.R. and Frehner M.: **Laboratory evidence for Krauklis wave resonance in fractures** (poster)
  - von Däniken P. and Frehner M.: **3D fold geometry at Panixer pass** (poster)
- EGU General Assembly, April 12–17 2015, Vienna, Austria
- Bakker R., Lupi M. and Frehner M.: **Effects of ice-cap unloading on shallow magmatic reservoirs** (poster)
  - Frehner M.: **3D fold growth rates in transpressional tectonic settings** (PICO)
  - Lupi M., Frehner M., Saenger E.H., Tisato N., Weis P., Geiger S., Chiodini G. and Driesner T.: **Delayed earthquake-volcano interactions at Campi Flegrei Caledra, Italy** (oral)
  - Tisato N. Frehner M., Busellato L. and Grasselli G.: **Localized sub-glacial deep karst formation due to water infiltration into glacier crevasses: A case study from Asiago, North Italy** (poster)
- 2014 Swiss Geoscience Meeting, November 21–22 2014, Fribourg, Switzerland
- Shih P.-J. R. and Frehner M.: **Laboratory evidence for Krauklis wave resonance in fractures** (poster)
  - Bakker R., Lupi M. and Frehner M.: **Effects of rapid icecap melting on a shallow magma chamber: A multi-disciplinary case study of Snæfellsjökull volcano, Western Iceland** (poster)
- Congress of the Italian Geological Society, September 10–12 2014, Milan, Italy
- Sala P., Pfiffner A. and Frehner M.: **Visualization and modeling techniques in complex tectonic settings for petroleum potential assessment, a geometrical example from a collisional mountain belt** (oral)
- International Conference on Textures of Materials, August 24–29 2014, Dresden, Germany
- Zhong X., Zappone A.S., Frehner M. and Kunze K.: **Numerical and Experimental Investigation on Seismic Anisotropy of Finero Peridotite, Ivrea-Verbano Zone, Northern Italy** (poster)
- EUCOP (European Conference on Permafrost), June 18–21 2014, Évora, Portugal
- Frehner M., Gärtner-Roer I. and Ling A.H.M.: **Furrow-and-ridge morphology on rockglaciers explained by gravity-driven buckle folding: A case study from the Murtèl rockglacier (Switzerland)** (oral)
- Euroconference on Rock Physics and Rock Mechanics, May 12–15 2014, Aussois, France

- Frehner M. and Lupi M.: **Krauklis wave initiation in fluid-filled fractures by a passing body wave: Finite-element modeling and application to earthquake-induced mudvolcanic tremor** (oral)
- Shih P.-J.R. and Frehner M.: **Numerical modeling and laboratory measurements of seismic properties in fractured fluid reservoirs** (poster)

Tectonomechanics Colloquium, May 5–6 2014, Zurich, Switzerland

- Frehner M., Philippe T. and May D.A.: **3D folds: Growth rates and linkage using the vorticity dominant wave length** (oral)

EGU General Assembly, April 27 – May 2 2014, Vienna, Austria

- Bakker R., Lupi M., Frehner M., Berger J. and Fuchs F.: **Volcanic unrest primed by ice cap melting: A case study of Snæfellsjökull volcano, Western Iceland** (PICO)
- Frehner M., Gärtner-Roer I. and Ling A.H.M.: **Rockglacier furrow-and-ridge morphology explained by gravity-driven buckle folding: A case study of the Murtèl rockglacier (Switzerland)** (oral)
- Frehner M. and Lupi M.: **Earthquake-induced seismic tremor explained by Krauklis wave resonance in fractured reservoir rocks: A case study of Salse di Nirano mud volcanic field (Italy)** (poster)
- Shih P.-J. R. and Frehner M.: **Fracture-related seismic propagation effects studied by combining numerical modeling and laboratory measurements** (poster)
- Zhong X., Frehner M., Zappone A. and Kunze K.: **A numerical and experimental investigation on seismic anisotropy of Finero Peridotite, Ivrea-Verbano Zone, northern Italy** (poster)

2013 AGU Fall Meeting, December 9–13 2013, San Francisco CA, USA

- Zhong X., Zappone A.S., Kunze K. and Frehner M.: **A numerical and experimental investigation on seismic anisotropy of Finero Peridotite, Ivrea-Verbano Zone, northern Italy** (poster)

Hubbert Quorum, December 8 2013, Menlo Park CA, USA

- Lupi M., Saenger E.H., Geiger S., Frehner M., Tisato N., Miller S.A., Fuchs F., Weis P., Driesner T.: **From the mud volcano catastrophe in Indonesia to the highest risk volcano in Europe: secret affairs between fluids and earthquakes revealed** (oral)

Swiss Geoscience Meeting, November 15–16 2013, Lausanne, Switzerland

- Frehner M.: **3D fold growth rates** (poster)
- Frehner M., Gärtner-Roer I. and Ling A.H.M.: **Furrow-and-ridge structures on active rockglaciers explained by gravity-driven buckle folding: A finite-element study applied to the Murtèl rockglacier** (oral)
- Philippe T.A., Frehner M. and May D.A.: **Single viscous layer fold interplay and linkage: A 3D-FEM modeling approach** (poster)
- Shih P.-J.R. and Frehner M.: **Numerical modeling and laboratory measurements of seismic properties in fractured fluid reservoirs** (poster)

Biot Conference on Poromechanics, July 10–12 2013, Vienna, Austria

- Frehner M.: **Krauklis wave initiation in fluid-filled fractures by a passing body wave** (oral)

Swiss Geomorphological Society Annual Meeting, June 26–28 2013, Basel, Switzerland

- Ling A.H.M., Frehner M. and Gärtner-Roer I.: **Application of buckle folding theory to the development of transverse ridges on a rockglacier** (poster)

Tectonomechanics Colloquium, April 15–16 2013, Paris, France

- Frehner M., Quintal B., Madonna C., Tisato N. and Saenger E.H.: **Multiscale laboratory and numerical rock physics – A snapshot of ongoing ROCKETH-science** (oral)

EGU General Assembly, April 7–12 2013, Vienna, Austria



- Frehner M.: **Initiation of Krauklis waves in fluid-filled fractures by an incident seismic body wave** (oral)
- Frehner M.: **3D fold growth rates** (poster)
- Frehner M. and Tisato N.: **Hands-on guide for 3D image creation for geological purposes** (poster)
- Ling A., Frehner M. and Gärtner-Roer I.: **Application of buckle folding theory to the development of transverse ridges on a rockglacier** (poster)
- Sala P., Pfiffner A. and Frehner M.: **Alpine fold-and-thrust structures revealed: A 3D model from the Helvetic Zone (Säntis area, Switzerland)** (oral)

2012 The Geological Society Conference: Industrial Structural Geology – Principles, Techniques and Integration, November 28–30 2012, London, UK

- Frehner M., Reif D. and Grasemann B.: **Dynamical unfolding for quality control of geological cross-sections** (poster)
- Sala P., Frehner M., Tisato N. and Pfiffner A.: **Modeling near surface with shallow borehole information** (poster)
- Sala P., Pfiffner A. and Frehner M.: **Alpine fold and thrust structures: a 3-D model of the Säntis area (Switzerland)** (poster)
- Tisato N., Madonna C., Quintal B., Frehner M., Kuteynikova M. and Saenger E.H.: **Combining laboratory and computational experiments to increase rock physics knowledge** (oral)

Swiss Geoscience Meeting, November 16–17 2012, Bern, Switzerland

- Collignon M., Kaus B., Frehner M., Fernandez N., Castelltort S., Simpson G. and Burg J.-P.: **Modeling interactions between tectonic and surface processes in the Zagros Mountain, Iran** (poster)
- Frehner M. and Exner U.: **Do foliation refraction patterns around buckle folds represent finite strain?** (poster)
- Frehner M., Reif D. and Grasemann B.: **Mechanical versus kinematical shortening reconstructions of the Zagros High Folded Zone (Kurdistan Region of Iraq)** (oral)
- Saenger E.H., Madonna C., Frehner M. and Almquist B.S.G.: **Numerical support of laboratory experiments: Attenuation and velocity estimations** (poster)
- Sala P., Pfiffner O.A. and Frehner M.: **Alpine fold and thrust structures: a 3-D model of the Säntis area (Switzerland)** (oral)
- Steeb H., Kurzeja P., Frehner M. and Schmalholz S.M.: **Phase velocity dispersion and attenuation of seismic waves due to trapped fluids in residual-saturated porous media** (poster)

GeoMod, July 16–18 2012, Lausanne, Switzerland

- Collignon M., Kaus B., Fernandez N., Castelltort S., Simpson G. and Frehner M.: **Modelling interaction between tectonics and surface processes in the Zagros mountain, Iran** (poster)
- Frehner M., Reif D. and Grasemann B.: **Mechanical versus kinematical shortening reconstructions of the Zagros High Folded Zone (Kurdistan Region of Iraq)** (poster)

EGU General Assembly, April 22–27 2012, Vienna, Austria

- Collignon M., Kaus B.J.P., Frehner M., Castelltort S., Simpson G. and Burg J.-P.: **Modeling interactions between tectonics and surface processes in the Zagros Mountains, Iran** (poster)
- Frehner M. and Exner U.: **Do foliation refraction patterns around buckle folds represent finite strain?** (poster)
- Frehner M., Reif D. and Grasemann B.: **Mechanical versus kinematical shortening reconstructions of the Zagros High Folded Zone (Kurdistan Region of Iraq)** (oral)
- Quintal B. and Frehner M.: **Effects of permeability barriers and pore fluids on S-wave attenuation** (poster)

- Saenger E.H., Frehner M., Madonna C., Tisato N., Kuteynikova M., Riahi N., Sala P. and Quintal B.: **Combining laboratory and computational rock physics** (poster)
  - Sala P., Pfiffner O.A. and Frehner M.: **Alpine fold and thrust structures: insight from the Säntis area (Switzerland)** (poster)
  - Sala P., Tisato N., Pfiffner O.A. and Frehner M.: **Building a 3D geological near surface model from borehole and laboratory data** (poster)
  - Steeb H., Kurzeja P., Frehner M. and Schmalholz S.M.: **Phase velocity dispersion and attenuation of seismic waves due to trapped fluids in residual-saturated porous media** (oral)
- 2011 Swiss Geoscience Meeting, November 11–13 2011, Zurich, Switzerland
- Frehner M.: **The neutral lines in buckle folds** (oral)
  - Frehner M. and Quintal B.: **Physical mechanisms for low-frequency seismic wave attenuation in fractured media** (poster)
  - Quintal B., Steeb H., Frehner M. and Schmalholz S.M.: **S-wave attenuation due to wave-induced fluid flow in heterogeneous, partially saturated porous media** (oral)
- DRT (Deformation mechanisms, Rheology and Tectonics) Conference, August 31 – September 2 2011, Oviedo, Spain
- Frehner M.: **The neutral lines in buckle folds** (oral)
- EGU General Assembly, April 3–8 2011, Vienna, Austria
- Burtscher A., Frehner M. and Grasemann B.: **Tectonic geomorphological investigations of antiforms using differential geometry (Permian Anticline, Northern Iraq)** (poster)
  - Frehner M.: **The neutral lines in buckle folds** (oral)
- Tectonomechanics Colloquium, March 31 –April 1 2011, Salzburg, Austria
- Frehner M.: **The neutral lines in buckle folds** (oral)
  - Tuitz C., Exner U., Frehner M. and Grasemann B.: **Variability in breakage load of pebbles in gravels, or: Does shape really matter?** (oral)
- 2010 Swiss Geoscience Meeting, November 19–20 2010, Fribourg, Switzerland
- Frehner M., Exner U., Mancktelow N. and Grujic D.: **The not-so-simple effects of boundary conditions on models of simple shear** (oral)
- GeoMod, September 27–29 2010, Lisbon, Portugal
- Frehner M. and Exner U.: **Boundary effects in physical models of simple shear** (poster)
- Pangeo, September 15–19 2010, Leoben, Austria
- Frehner M., Exner U., Mancktelow N.S. and Grujic D.: **The not-so-simple effects of boundary conditions on models of simple shear** (oral)
- ECCM (European Conference on Computational Mechanics), May 16–21 2010, Paris, France
- Steeb H., Frehner M. and Schmalholz S.M.: **Oscillatory waves in residual saturated porous media: Theoretical and numerical investigations** (oral)
- EGU General Assembly, May 2–7 2010, Vienna, Austria
- Exner U., Frehner M., Mancktelow N.S. and Grujic D.: **Why homogeneous boundary conditions lead to heterogeneous internal strain in analogue simple shear experiments – explained by numerical modeling** (poster)
  - Frehner M., Reif D. and Grasemann B.: **Mechanical restoration of large-scale folded multilayers using the finite element method: Application to the Zagros Simply Folded Belt, N-Iraq** (poster)
  - Frehner M., Steeb H. and Schmalholz S.M.: **Wave velocity dispersion and attenuation in media exhibiting internal oscillations** (oral)
  - Tschegg C., Grasemann B. and Frehner M.: **The transition of boudinage into brittle low-angle faults – chemical and mechanical feedback mechanisms** (poster)
- Tectonomechanics Colloquium, April 29–30 2010, Salzburg, Austria

- Frehner M. and Exner U.: **How homogeneous boundary conditions lead to heterogeneous strain in analogue simple shear models** (oral)
- DGG (German Geophysical Union) Annual Meeting, March 15–18 2010, Bochum, Germany
- Steeb H., Frehner M. and Schmalholz S.M.: **Wave propagation phenomena in residual-saturated rocks** (poster)
- 2009 AGU Fall Meeting, December 14–18 2009, San Francisco CA, USA
- Frehner M. and Schmalholz S.M.: **Reflection and scattering of Stoneley guided waves at the tips of fluid-filled fractures** (poster)
- Swiss Geoscience Meeting, November 20–21 2009, Neuchatel, Switzerland
- Frehner M. and Schmalholz S.M.: **Reflection and scattering of Stoneley guided waves at the tips of fluid-filled fractures** (poster)
- Tectonomechanics Colloquium, May 15–16 2009, Salzburg, Austria
- Frehner M. and Schmalholz S.M.: **Stoneley guided wave reflection and scattering at the tips of fluid-filled finite fractures** (oral)
- EGU General Assembly, April 19–24 2009, Vienna, Austria
- Frehner M. and Schmalholz S.M.: **Reflection, radiation and attenuation of Stoneley guided waves in fluid-filled finite cracks** (poster)
- DGG (German Geophysical Union) Annual Meeting, March 23–26 2009, Kiel, Germany
- Frehner M. and Schmalholz S.M.: **Reflection, radiation and attenuation of Stoneley guided waves in fluid-filled fractures** (oral)
- GAMM (International Association of Applied Mathematics and Mechanics) Annual Meeting, February 9–13 2009, Gdansk, Poland
- Steeb H., Frehner M. and Schmalholz S.M.: **Numerical modeling of scattered elastic waves: Finite element method versus finite difference method** (oral)
- 2008 Swiss Geoscience Meeting, November 21–23 2008, Lugano, Switzerland
- Frehner M., Deubelbeiss Y., Schmalholz S.M., Kaus B., Saenger E.H. and Steeb H.: **Finite element method versus finite difference method: Numerical accuracy study for two different applications** (oral)
- SEG Summer Research Workshop: Emergent and Challenging Issues in Rock Physics: Rock This House!, July 20–24 2008, Galway, Ireland
- Schmalholz S.M., Steeb H., Saenger E.H. and Frehner M.: **Theoretical and numerical modeling of waves in three-phase media** (poster)
- EGU General Assembly, April 13–18 2008, Vienna, Austria
- Frehner M., Steeb H., Saenger E.H. and Schmalholz S.M.: **Numerical modeling of wave propagation in heterogeneous and poroelastic rocks** (oral)
- 2007 EGU General Assembly, April 15–20 2007, Vienna, Austria
- Frehner M. and Schmalholz S.M.: **Numerical simulations of parasitic folding and strain distribution in multilayer systems** (oral)
  - Frehner M., Schmalholz S.M., Podladchikov Y. and Holzner R.: **Low frequency spectral modification of geoseismic background noise due to interaction with oscillating fluids entrapped in subsurface porous rocks** (poster)
- 2006 Swiss Geoscience Meeting, November 24–25 2006, Bern, Switzerland
- Frehner M. and Schmalholz S.M.: **Numerical simulations of parasitic folding in multilayers** (oral)
- EAGE Conference, Workshop 3: What can EP learn from seismology and vice versa, June 11 2006, Vienna, Austria

- Holzner R., Eschle P., Dewarrat R., Lambert M., Meftahi R., Graf R., Schmalholz S.M., Steiner B., Frehner M. and Podladchikov Y.: **Identification of reservoirs by Hydrocarbon Microtremor Analysis (HyMAS)** (poster)

EGU General Assembly, April 2–7 2006, Vienna, Austria

- Frehner M. and Schmalholz S.M.: **Numerical simulations of parasitic folding in multilayers** (poster)

GEO Middle East Geoscience Conference, March 27–29 2006, Manama, Bahrain

- Holzner R., Eschle P., Lambert M., Dewarrat R., Meier P.F., Dangel S., Graf R., Frehner M., Schmalholz S.M. and Podladchikov Y.: **Linear model for low frequency pore liquid oscillations observed in Hydrocarbon Microtremor Analysis (HyMAS)** (poster)

2005 AAPG International Conference, September 11–14 2005, Paris, France

- Burg J.-P., Bahroudi A., Simpson G., Schmalholz S.M., Dolati A. and Frehner M.: **Preliminary structural results on the Makran accretionary wedge, Iran** (oral)

### **OTHER INVITED PRESENTATIONS**

2017 Job Interview at the Department of Earth Sciences, ETH Zurich, Switzerland, May 18–19 2017

- Frehner M.: **This is RockETH Science: Computational Structural Geology, Digital Rock Physics, and beyond...** (oral)

2016 Introductory lecture for receiving the Venia Legendi (Habilitation), Department of Earth Sciences, ETH Zurich, Switzerland, November 4 2016

- Frehner M.: **Computational Structural Geology – A modern support for field geologists** (oral)

Technical Meeting of the Mont Terri Project, Porrentruy, Switzerland, February 11 2016

- Lupi M., Violay M., Frehner M. and Saenger E.H.: **FReD: Fault reactivation frequency-dependent** (oral)

2015 Job Interview at the Department of Earth Sciences, VU University Amsterdam, The Netherlands, Mai 27 2015

- Frehner M.: **Computational Structural Geology & Digital Rock Physics – Modern tools integrated into field and lab investigations** (oral)

Department Seminar, Section for Earth and Environmental Sciences, University of Geneva, Switzerland, April 24 2015

- Frehner M.: **Insights into the dynamics of folds by Computational Structural Geology** (oral)

Conference, Centre for Hydrogeology and Geothermics, University of Neuchatel, Switzerland, April 23 2015

- Frehner M.: **Insights into the dynamics of folds by Computational Structural Geology** (oral)

2013 Earth Science Colloquium, Institute of Geological Sciences, University of Bern, Switzerland, March 4 2013

- Frehner M.: **Insights into the dynamics of folds by Computational Structural Geology** (oral)

2012 Poroelasticity Minisymposium, ETH Zurich, Switzerland, June 26 2012

- Steeb H., Kurzeja P., Schmalholz S.M. and Frehner M.: **Multi-scale modeling of waves in partially saturated rocks** (oral)

Geophysical Fluid Dynamics Seminar, Institute of Geophysics, ETH Zurich, Switzerland, May 23 2012

- Frehner M.: **Fold analysis and dynamical unfolding in the Zagros High Folded Zone, Kurdistan Region of Iraq** (oral)
- Job Interview at the Department of Earth Science and Engineering, Imperial College London, UK, March 20 2012
- Frehner M.: **Integrating Numerics into Geoscience – Examples from Computational Structural Geology and Digital Rock Physics** (oral)
- 2011 Seminar Géologie des Alps, Institute of Geology and Paleontology, University of Lausanne, Switzerland, November 8 2011
- Frehner M.: **Folds in nature and in the computer** (oral)
- Seminar at Physics of Geological Processes (PGP), Oslo, Norway, October 20 2011
- Frehner M.: **Folds in nature and in the computer** (oral) available online on [www.youtube.com/user/pgpuio?feature=mhee#p/c/2/OM7eupd4Hz8](http://www.youtube.com/user/pgpuio?feature=mhee#p/c/2/OM7eupd4Hz8) or [vimeo.com/31646310](http://vimeo.com/31646310)
- Kurdish Region of Iraq Workshop, Österreichische Mineralölverwaltung Aktiengesellschaft (OMV), Vienna, Austria, October 19 2011
- Frehner M., Burtscher A., Grasmann B., Reif D.: **Tectonic geomorphological investigations and mechanical versus kinematical shortening estimates of folded multilayers: Application to the Permian and adjacent anticlines, Zagros Simply Folded Belt, Kurdistan Region of Iraq** (oral)
- Informal Structural Seminar, Department for Geodynamics and Sedimentology, University of Vienna, Austria, October 18 2011
- Frehner M.: **Folds in nature and in the computer** (oral)
- Geophysics Network meeting, Petrobras Research Center (CENPES), Rio de Janeiro, Brazil, August 19 2011
- Quintal B., Frehner M., Saenger E.H. and The Rock Physics Network at ETH Zurich: **Integrated laboratory and numerical rock physics applied to seismic characterization of reservoirs** (poster)
- 2010 Zagros fold and thrust belt (Kurdistan, NE Iraq) Workshop at Österreichische Mineralölverwaltung Aktiengesellschaft (OMV), Vienna, Austria, December 15 2010
- Frehner M.: **Kinematical versus mechanical balancing techniques and curvature analysis of digital elevation models in the Zagros fold and thrust belt (Kurdistan, NE Iraq)** (oral)
- Job Interview at the Structural Geology and Tectonics Group, Geological Institute, ETH Zurich, Switzerland, June 30 2010
- Frehner M.: **Numerics in Geosciences – A useful tool across disciplines** (oral)
- EP Technology Platform at Österreichische Mineralölverwaltung Aktiengesellschaft (OMV), Vienna, Austria, February 25 2010
- Exner U., Rath A. and Frehner M.: **Deformation bands in reservoir analogues at the margin of the Vienna Basin: Microstructural and mineralogical characterization of petrophysical properties** (oral)
- 2009 Seminarreihe des Lehrstuhls für Kontinuumsmechanik, Ruhr-University Bochum, Germany, September 9 2009
- Frehner M.: **Stoneley guided wave reflection and scattering at the tips of fluid-filled finite fractures** (oral)
- EP Technology Platform at Österreichische Mineralölverwaltung Aktiengesellschaft (OMV), Vienna, Austria, June 5 2009
- Grasmann B., Reif D., Bartl N., Bretis B., Frehner M. and Faber R.: **Quantitative tectonics and geomorphology in the Zagros fold and thrust belt (N-Iraq)** (oral)

- 2008 Job Interview at Schlumberger Cambridge Research (SCR), Cambridge, UK, July 4 2008
- Frehner M.: **Potential mechanisms for low-frequency spectral anomalies** (oral)
- Workshop at Chevron Corporation: Spectraseis' Passive Technology & Chevron West Texas Field Test, San Ramon CA, USA, April 29 2008
- Frehner M.: **Potential mechanisms for low-frequency spectral anomalies** (oral)
- Workshop at Abu Dhabi Company for Onshore Oil Operations (ADCO): Hydrocarbon Microtremors, Abu Dhabi, United Arab Emirates, January 22 2008
- Saenger E.H. and Frehner M.: **Hydrocarbon microtremor research** (oral)
- 2006 Diplomandenkongress, Department of Earth Sciences, ETH Zurich, Switzerland, February 10 2006
- Frehner M.: **Numerische Simulation von Parasitärfaalten in Mehrschicht-Systemen** (oral in German)

## OTHER PRESENTATIONS

- 2016 Poroelasticity Minisymposium, Bochum University of Applied Sciences, Germany, February 23 2016
- Frehner M., Verheij J., Zhubayev A., Houben M and Barnhoorn A.: **How seismic attenuation marks the transition from elastic to inelastic deformation in laboratory rock fracturing experiments** (oral)
- 2015 Poroelasticity Minisymposium, ETH Zurich, Switzerland, February 24 2015
- Shih P.-J.R. and Frehner M.: **Laboratory evidence for Krauklis wave resonance in a fracture and implications for seismic coda wave analysis** (oral)
- 2014 Poroelasticity Minisymposium, University of Lausanne, Switzerland, February 18 2014
- Shih P.-J.R. and Frehner M.: **Laboratory measurements and numerical modeling of Krauklis wave initiation in fractured media** (poster)
  - Zhong X., Frehner M., Kunze K. and Zappone A.: **Integrated study of seismic anisotropy of Finero Peridotite (Ivrea-Verbano Zone, northern Italy) by combining laboratory measurements, EBSD-based estimations, and fully anisotropic numerical wave-propagation simulation** (poster)
- Visit of ExxonMobil delegation at ETH Zurich, Switzerland, January 8 2014
- Frehner M.: **Krauklis waves in fractured rocks and oscillations in residual saturated rocks** (oral)
- 2013 Poroelasticity Minisymposium, ETH Zurich, Switzerland, February 19 2013
- Frehner M.: **On Krauklis waves in fluid-saturated fractured rocks** (oral)
- 2012 Poroelasticity Minisymposium, ETH Zurich, Switzerland, June 26 2012
- Quintal B., Steeb H., Frehner M., Saenger E.H. and Schmalholz S.M.: **Effects of pore fluids and permeability barriers on S-wave attenuation** (poster)
  - Saenger E.H., Frehner M., Madonna C., Tisato N., Kuteynikova M., Riahi N., Sala P. and Quintal B.: **Combining laboratory and computational rock physics** (poster)
- 2011 Visit of Petrobras management delegation at ETH Zurich, Switzerland, October 31 2011
- Frehner M., Saenger E.H. and Madonna C.: **Integrated laboratory and numerical rock physics applied to seismic characterization of reservoir rocks** (oral)
- Structural Geology and Tectonics Seminar, Geological Institute, ETH Zurich, Switzerland, October 26 2011
- Frehner M.: **Folds in nature and in the computer** (oral)
- 2010 Informal Structural Seminar, Department for Geodynamics and Sedimentology, University of Vienna, Austria, December 14 2010
- Frehner M.: **Vienna in retrospective** (oral)

- Informal Structural Seminar, Department for Geodynamics and Sedimentology, University of Vienna, Austria, November 23 2010
- Frehner M., Grasemann B., Rice H., Petrakakis K., Schober A., Bichler M., Kollmann C., Homolova D. and Blumel A.: **Excursion report from Greece** (oral)
- Informal Structural Seminar, Department for Geodynamics and Sedimentology, University of Vienna, Austria, May 11 2010
- Exner U., Frehner M., Mancktelow N.S. and Grujic D.: **Why homogeneous boundary conditions lead to heterogeneous internal strain in analogue simple shear experiments – explained by numerical modeling** (poster)
  - Frehner M., Reif D. and Grasemann B.: **Mechanical restoration of large-scale folded multilayers using the finite element method: Application to the Zagros Simply Folded Belt, N-Iraq** (poster)
  - Tschegg C., Grasemann B. and Frehner M.: **The transition of boudinage into brittle low-angle faults – chemical and mechanical feedback mechanisms** (poster)
- Informal Structural Seminar, Department for Geodynamics and Sedimentology, University of Vienna, Austria, April 27 2010
- Frehner M.: **Numerical models in Geosciences** (oral)
- Informal Structural Seminar, Department for Geodynamics and Sedimentology, University of Vienna, Austria, March 23 2010
- Frehner M. and Exner U.: **Boundary effects in physical models of simple shear** (oral)
- 2009 Earth Science Colloquium, Center for Earth Sciences, University of Vienna and Austrian Geological Society (ÖGG), Vienna, Austria, November 12 2009
- Frehner M.: **Numerical modeling of multiscale wave propagation phenomena in fluid-rock systems** (oral)
- Informal Structural Seminar, Department for Geodynamics and Sedimentology, University of Vienna, Austria, June 9 2009
- Frehner M. and Grasemann B.: **Curvature analysis of digital elevation models and mechanical restoration of folds using the finite element method** (oral)
- Informal Structural Seminar, Department for Geodynamics and Sedimentology, University of Vienna, Austria, April 28 2009
- Frehner M. and Schmalholz S.M.: **Reflection, radiation and attenuation of Stoneley guided waves in fluid-filled finite cracks** (poster)
- PhD defense, Geological Institute, ETH Zurich, Switzerland, March 13 2009
- Frehner M.: **Numerical modeling of multiscale wave propagation phenomena in fluid-rock systems** (oral)
- 2008 Seminar of ETH-Spectraseis-CTI Research Group at Spectraseis AG, Zurich, Switzerland, November 7 2008
- Frehner M.: **Scattering and internal oscillations in heterogeneous rocks – Numerical and analytical studies** (oral)
- 2007 Structural Geology and Tectonics Seminar, Geological Institute, ETH Zurich, Switzerland, May 16 2007
- Frehner M., Schmalholz S.M., Podladchikov Y. and Holzner R.: **Low frequency spectral modification of geoseismic background noise due to interaction with oscillating fluids entrapped in subsurface porous rocks** (poster)
- Structural Geology and Tectonics Seminar, Geological Institute, ETH Zurich, Switzerland, May 9 2007
- Frehner M. and Schmalholz S.M.: **Numerical simulations of parasitic folding and strain distribution in multilayer systems** (oral)
- 2006 PhD Proposal defense, Geological Institute, ETH Zurich, Switzerland, September 5 2006

- Frehner M.: **Hydrocarbon reservoir detection by integrating microtremor analysis and computational geodynamics** (oral)

Structural Geology and Tectonics Seminar, Geological Institute, ETH Zurich, Switzerland, April 19 2006

- Frehner M. and Schmalholz S.M.: **Numerical simulations of parasitic folding in multilayers** (poster)

2005 Master Thesis defense, Geological Institute, ETH Zurich, Switzerland, October 27 2005

- Frehner M.: **Strain distribution of buckled multilayer systems and its influence on the development of asymmetric parasitic folds** (oral)

## **OTHER WRITTEN WORK**

2017 Ziegler M., Frehner M., 2017: **Implementing digital mapping and data acquisition in geology field courses**, Application for educational focus project, submitted to the Innovedum Fund, ETH Zurich, Switzerland

2014 Frehner M., Tisato N., Steeb H., Füsseis F., Zappone A.S. and Burg J.-P., 2014: **CO<sub>2</sub>-exsolution and bubble nucleation in porous reservoir rocks filled with CO<sub>2</sub>-saturated fluid under in-situ pressure conditions: Application to CO<sub>2</sub>-sequestration hazard and seismic wave attenuation**, Application for 72 hours measurement-time at the TOMCAT-beamline at the Swiss Light Source (SLS), submitted to the Paul Scherrer Institute, Villingen, Switzerland, Proposal No. 20140051

2013 Frehner M., Steeb H., Madonna C., Füsseis F., Saenger E.H. and Burg J.-P., 2013: **Digital Rock Physics: Oscillatory behavior of residual fluid in porous rocks**, Application for 72 hours measurement-time at the TOMCAT-beamline at the Swiss Light Source (SLS), submitted to the Paul Scherrer Institute, Villingen, Switzerland, Proposal No. 20130271

Madonna C., Saenger E.H., Frehner M., Quintal B., Krakowska P.I. and Burg J.-P., 2013: **Digital Rock Physics: Pressure-dependent elastic properties**, Application for 72 hours measurement-time at the TOMCAT-beamline at the Swiss Light Source (SLS), submitted to the Paul Scherrer Institute, Villingen, Switzerland, Proposal No. 20130402

2012 Frehner M., 2012: **UPseis: Upscaling of seismic properties in fractured fluid reservoirs**, Application for funding of a stand-alone project for 1 PhD-student, submitted to the Swiss National Science Foundation (SNF), Proposal No. 200021\_143319

2011 Frehner M., 2011: **Upscaling of fracture-related seismic attenuation mechanisms in fluid-filled reservoirs**, Application for funding of a stand-alone project for 1 PhD-student, submitted to the Swiss National Science Foundation (SNF), Proposal No. 200021\_137620

Madonna C., Saenger E.H., Frehner M. and Burg J.-P., 2011: **Digital rock physics: Calibration with laboratory measurements**, Application for 40 hours measurement-time at the TOMCAT-beamline at the Swiss Light Source (SLS), submitted to the Paul Scherrer Institute, Villingen, Switzerland, Proposal No. 20110192

2010 Exner U., Decker K., Frehner M. and Grasmann B., 2010: **3D porosity and permeability model of fractured Hauptdolomit reservoir core samples**, Application for funding of a research project for 2 PhD-students, submitted to the OMV Exploration and Production GmbH, Vienna, Austria

Abart R., Grasmann B., Exner U., Frehner M., Habler G., Klötzli U. and Nasdala L., 2010: **Deformation in geological materials: Mechanical-chemical feedback and the coupling across scales**, Application for funding of a structured doctoral program (Initiativkollegs) for 12 PhD-students submitted to the University of Vienna, Austria

2009 Frehner M., 2009: **Fluid migration and effects of fluids on seismic wave propagation in porous and fractured rocks with application to deformation bands**, Application for



funding of a stand-alone project for 2 PhD-students, submitted to the Austrian Science Fund (FWF), Project No. P22337-N22

- Grasemann B., Rice H. and Frehner M., 2009: **Textures and microstructures in fault rocks from brittle/ductile low-angle faults: Controls of deformation mechanisms on fault strength**, Application for a research grant for 2 PhD-students, Project No. 13 of the proposal for a second funding period of the research group FOR 741 D-A-CH of the German Research Foundation (DFG) entitled "Nanoscale processes and geomaterials properties"
- 2006 Frehner M., 2006: **Hydrocarbon reservoir detection by integrating microtremor analysis and computational geodynamics**, PhD Proposal, Geological Institute, ETH Zurich, Switzerland, supervised by Dr. Stefan M. Schmalholz and Prof. Jean-Pierre Burg
- Quintal B., Frehner M., Lambert M., Podladchikov Y. and Schmalholz S.M.: **Mapping reservoirs and reservoir fluids**, U.S. Provisional Application for Patent No. 60869346, filed December 10 2006
- 2005 Frehner M., 2005: **Grossräumige Geometrie von Akkretionskeilen**, Term paper, Structural Geology and Tectonics Group, Geological Institute, ETH Zurich, Switzerland, supervised by Prof. Jean-Pierre Burg (in German)
- 2004 Brönnimann C., Deubelbeiss Y., Seiler A. and Frehner M., 2004: **Ingenieurgeologisches Feldpraktikum: Sondermülldeponie Kölliken (SMDK)**, Term paper, Engineering Geology Group, Geological Institute, ETH Zurich, Switzerland, supervised by Dr. Frank Lemy, Dr. Edward A. Button and Prof. Simon Löw (in German)
- 2003 Frehner M., 2003: **Geologische Kartierarbeit Panixerpass**, Geological Map 1:10'000 of Panixerpass area, Canton Glarus, Switzerland, including documentation, Structural Geology and Tectonics Group, Geological Institute, ETH Zurich, Switzerland, supervised by Dr. Bas den Brok and Prof. Jean-Pierre Burg (in German)