



Schweizerischer Erdbebedienst
Service Sismologique Suisse
Servizio Sismico Svizzero
Swiss Seismological Service

ETH zürich

Program

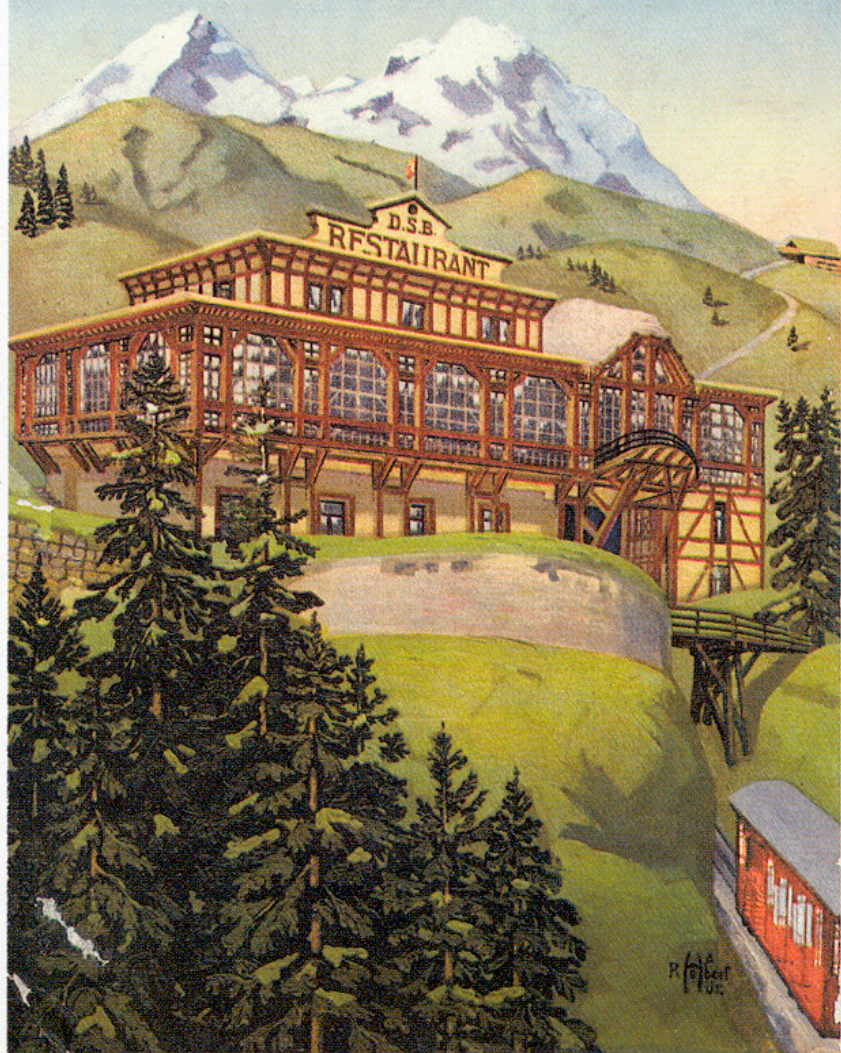
10 - 13 March 2015
DAVOS

SCHATZALP

*Induced Seismicity
Workshop*

Schatzalp mit Schlahörner
2719 m ü. M.

Davos, Bahnkasino
1865 m ü. M.



R. Folger
1902

Thomas Mann's „The Magic Mountain“

„An unassuming young man was travelling, in midsummer, from his native city of Hamburg to Davos-Platz in the Canton of the Grisons, on a three weeks' visit.

[...] At Rorschach, in Swiss territory, you take train again, but only as far as Landquart, a small Alpine station, where you have to change. Here, after a long and windy wait in a spot devoid of charm, you mount a narrow-gauge train; and as the small but very powerful engine gets under way, there begins the thrilling part of the journey, a steep and steady climb that seems never to come to an end. For the station of Landquart lies at relatively low altitude, but now the wild and rocky route pushes grimly onward into the Alps themselves.

[...] The train wound in curves along the narrow pass; he could see the front carriages and the labouring engine vomiting great masses of brown, black, and greenish smoke, that floated away. Water roared in the abysses on the right; on the left, among rocks, dark fir trees aspired toward a stone-grey sky. The train passed through pitch-black tunnels, and when daylight came again it showed wide chasms, with villages nestled in their depths. Then the pass closed in again; they wound along narrow defiles, with traces of snow in chinks and crannies. There were halts at wretched little shanties of stations; also at more important ones, which the train left in the opposite direction, making one lose the points of the compass. A magnificent succession of vistas opened before the awed eye, of the solemn, phantasmagorical world of towering peaks, into which their route wove and wormed itself: vistas that appeared and disappeared with each new winding of the path. [...] He perceived that they had stopped climbing. The top of the col was reached; the train rolled smoothly along the level valley floor.

[...] A lake was visible in the distant landscape, its water grey, its shores covered with black fir forests that climbed the surrounding heights, thinned out, and gave place to bare, mist-wreathed rock. They stopped at a small station. Hans Castorp heard the name called out: it was ‚Davos-Dorf.‘



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Welcome to Switzerland and Welcome to the first Schatzalp Workshop on Induced Seismicity!



What does it take to organize a memorable workshop? This is what we asked ourselves in the spring of 2014, when the AGIS group asked the Swiss Seismological Service (SED) to host their bi-annual international workshop in Switzerland. We concluded that the combination of a great location, a hot topic, and enough money to invite many distinguished keynote speakers would possibly be the right recipe. In fact, we are positively overwhelmed by the feedback and turnout, and we are excited to host this workshop for you here in the middle of the Swiss Alps.



Strangely enough, tiny Switzerland is often on the front lines when it comes to induced earthquakes. In 2006, the Basel Enhanced Geothermal System (EGS) project was abruptly terminated after an induced magnitude ML3.4 earthquake caused minor damages to hundreds of houses. The failure of this visionary project was a major setback for advancing deep geothermal energy from crystalline environments around the world. In 2013, the St. Gallen hydrothermal project tried again to extract energy from the deep underground beneath Switzerland. The project targeted the Mesozoic limestone layers of the Molasse sedimentary basin that have been tapped in a number of successful deep geothermal projects in southeastern Germany. The story of the project in St. Gallen is not without irony: the project was initially conceived to be earthquake-free, the antipode to the Basel EGS project. However, these hopes were shaken when at 5:30 a.m. local time on July 20 2013, a magnitude ML3.5 earthquake occurred, induced during a well-control operation following a gas-kick 4.2 km deep.

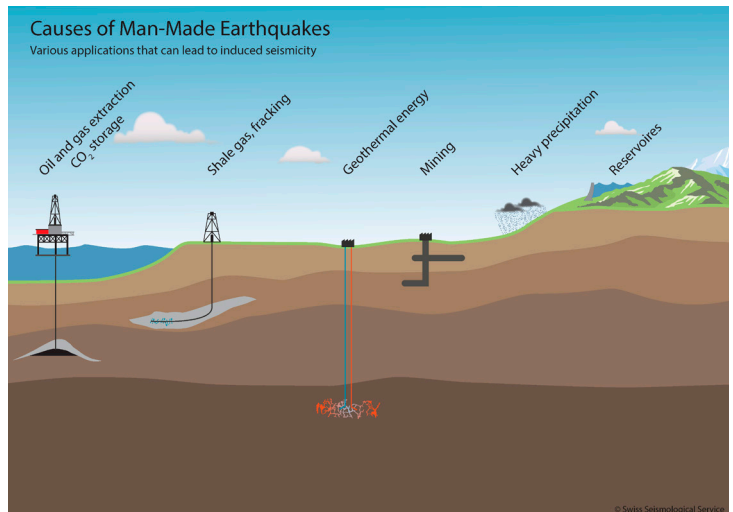
Despite the past setbacks, deep geothermal energy is seen as a potentially important source of clean and renewable energy for Switzerland, closing a gap in energy production left by the upcoming phase-out of aging nuclear reactors. Therefore, understanding induced earthquakes, being able to assess the risk they pose, and possibly even to control and reduce this risk remain important goals, and not only for Switzerland. We believe that these challenges are first of all scientific ones, because we do not understand enough the physical processes at work, nor do we have techniques or procedures to assess and mitigate the hazard and risk during all project stages. Nevertheless, every challenge is also an opportunity, and by studying induced earthquakes that often occur under rather controlled conditions, we will learn much

more about the physics of earthquakes. Finally, induced seismicity is an international problem, one where we can best make progress if we collaborate and plan for joint research actions. In this spirit, we hope that this workshop will contribute to the development of an international roadmap for studying induced seismicity.

Let us close by thanking the scientific committee – Bernard Dost (KNMI), Thomas Braun (INGV), Tomas Fischer (Univ. Prague), and Volker Oye (NORSAR) – for helping to select the program, the Swiss Federal Office of Energy (SFOE) and the Swiss Competence Center on Supply of Electricity (SCCER-SoE) for their generous financial support, and the working group Induced Seismicity (AGIS) of the FKPE for their support and flexibility.

Wishing us all a successful workshop,

Stefan Wiemer, Manfred Joswig, and Toni Kraft



Workshop Program: Understanding and Managing Induced Seismicity

Tuesday's Program, March 10

from 16:00 **Registration**

from 18:00 **Ice-breaker with apéro riche**

Wednesday's Program, March 11

from 07:45 **Registration**

08:15 **Stefan Wiemer (SED), Manfred Joswig (AGIS/FKPE),
Gunter Siddiqi (SFOE)**
Welcome address

Session 1 Extraction Plays

Oil and Gas, Coal Mining, Ground Water, etc.

08:30 **Keynote: Bernard Dost (KNMI)**
Hydrocarbon induced seismicity in Northern Netherlands

08:50 **Solicited: Paolo Gasparini (AMRA Italy)**
The ICHESE report on the relationship between Hydrocarbon Exploration and the May 2012 earthquakes in the Emilia Region (Italy) and their consequences

09:05 **Solicited: Nicolai Gestermann (BGR)**
Induced seismicity at the natural gas fields in Northern Germany

09:20 **Keynote: Stanislaw Lasocki (Polish Acad. Sci.)**
From hazard assessment to hazard management. The case of mining induced seismicity

09:40 **Discussion**
Moderator: Manfred Joswig (AGIS/FKPE)

10:00 - 10:20 **Coffee break**

Session 2 Injection Plays

Deep Geothermal, Wastewater Disposal, Fracking, CO₂ Storage

- 10:20 **Keynote: William Ellsworth (USGS)**
Earthquake Hazard When the Rate is Non-Stationary: The Challenge of the U.S. Midcontinent
- 10:40 **Solicited: Justin Rubinstein (USGS)**
Wastewater Disposal, Hydraulic Fracturing, and Seismicity in Southern Kansas
- 10:55 **Solicited: Jack Baker (Univ. Stanford)**
Developing Decision Support Tools and Quantifying Changes in Site Hazard for Induced Seismicity through Bayesian Inference
- 11:10 **Solicited: Luigi Imbrota (INGV)**
A detailed analysis of initial seismicity induced by wastewater injection in the Val d'agri oil field (Italy)
- 11:25 **Keynote: Honn Kao (Geol. Survey Canada)**
Natural Resources Canada's Induced Seismicity Research
- 11:45 **Keynote: Mark Zoback (Univ. Stanford)**
Saltwater Disposal and Triggered Earthquakes in Oklahoma: Implications for Large Scale CO₂
- 12:05 **Discussion**
Moderator: Ian Main (Univ. Edinburgh)

12:25 - 14:00 **Lunch break**

Session 3 Modeling of Induced Seismicity

Numerical Modeling, Geomechanical Aspects, and Physical Constrains

- 14:00 **Keynote: Richard Sibson (Univ. Otago)**
Lessons from Natural Vein Swarms on the Factors Affecting Hydrothermal Flow in Fault-Fracture Systems
- 14:20 **Keynote: Mark McClure (Univ. Texas)**
Predictive Modeling of Induced Seismicity: Numerical Approaches, Applications, and Challenges
- 14:40 **Solicited: James Verdon (Univ. Bristol)**
Simulation of seismic events induced by CO₂ injection at In Salah, Algeria

- 14:55 **Solicited: Jean Paul Ampuero (Caltech)**
Constraints on maximum magnitude of induced seismicity derived from rupture dynamics models
- 15:10 **Solicited: Dimitrios Karvounis (SED)**
Monte Carlo Simulations of EGS Stimulation Phase with a 3-D Hybrid Model
- 15:25 **Solicited: Silvia De Simone (CSIC Barcelona)**
On the role of processes interaction in the triggering of post-injection seismicity in Enhanced Geothermal Systems
- 15:40 **Discussion**
Moderator: Emily Brodsky (UC Santa Cruz)

16:00 - 18:30 **Coffee, wine, cheese, and posters**

from 19:00 **Sledging to Davos and dinner in small groups**

Thursday's Program, March 12

Session 4 Scaled Experiments

Underground Labs, Petrophysical Labs

- 08:00 **Keynote: Sergey Stanchits (Schlumberger)**
What Can we Learn about Induced Fracturing from Acoustic Emission Monitoring in the Laboratory?
- 08:20 **Solicited: Philip Benson (Portsmouth)**
Laboratory simulations of fluid-induced seismicity in shallow volcanic settings
- 08:35 **Solicited: Jean-Francois Molinari (EPFL)**
Modeling slip precursors at frictional interfaces
- 08:50 **Keynote: Yasuo Yabe (Univ. Tohoku)**
Monitoring of Microseismicity in Deep Gold Mines in South Africa
- 09:10 **Solicited: Torsten Dahm (GFZ)**
Physics-based models of stress shadows for rates of induced seismicity
- 09:25 **Keynote: Ian Main (Univ. Edinburgh)**
Partitioning of seismic and aseismic strain

09:45 **Discussion**
Moderator: Volker Oye (NORSAR)

10:05 - 10:30 **Coffee break**

Session 5 Risk Governance, Societal Acceptance, and License to Operate

10:30 **Keynote: Michael Stauffacher (ETHZ)**
Risk governance for induced seismicity: a view from the social sciences

10:50 **Keynote: Serge A. Shapiro (FU Berlin)**
Seismogenic Index, Bounds of Magnitude Probability and Triggered versus Induced Earthquakes

11:10 **Keynote: Stefan Wiemer (SED)**
Hybrid Modeling of induced seismicity: Towards Adaptive Traffic Lights

11:30 **Keynote: Warner Marzocchi (INGV)**
Using hazard information for establishing a rationale decision-making

11:50 **Discussion**
Moderator: William Ellsworth (USGS)

12:10 - 14:00 **Lunch break**

Session 6 Monitoring and Analysis of Induced Seismicity

14:00 **Keynote: Emily Brodsky (UC Santa Cruz)**
The Uses of Dynamic Triggering and Dynamic Permeability Enhancement For The Study of Induced Seismicity

14:20 **Solicited: Václav Vavryčuk (Czech Acad. Sci.)**
Interpretation of moment tensors of induced earthquakes: a review

14:35 **Solicited: Emmanuel Gaucher (KIT)**
Migration based detection and location of the microseismicity induced at Rittershoffen geothermal field (Alsace, France)

14:50 **Solicited: Ted Urbancic (ESG Canada)**
Rupture Characteristics of Hydraulic Fracture Induced Seismicity with $M > 0$

- 15:05 **Solicited: Toni Kraft (SED)**
Lessons learned from the 2013 ML3.5 induced earthquake sequence at the St. Gallen geothermal site.
- 15:20 **Solicited: Benjamin Edwards (SED)**
Ground-motion and Intensity: were the Basel 2006 and St. Gallen 2013 Events Fundamentally Different?
- 15:35 **Keynote: Greg Beroza (Univ. Stanford)**
Ground Motion Prediction for Induced Seismicity Using the Ambient Seismic Field
- 15:55 **Discussion**
Moderator: Shawn Maxwell (IMaGE)

16:15 - 18:45 **Coffee, wine, cheese, and posters**

from 19:30 **Conference dinner**

Friday's Program, March 13

Session 7 Industry Projects and Future Initiatives

- 08:30 **Keynote: Peter Meier (GES)**
Future Multi-stage EGS projects in Switzerland
- 08:50 **Keynote: Shawn Maxwell (IMaGE)**
Monitoring and Mitigating Induced Seismicity: Some Practical Considerations
- 09:10 **Solicited: Peter Styles (Univ. Keele)**
Seismicity induced by Shale Gas Hydraulic Stimulation: Preese Hall, Blackpool, United Kingdom
- 09:25 **Solicited: Dirk Kraaijpoel (KNMI)**
Probabilistic Seismic Hazard Assessment for Seismicity Induced by Gas Extraction in the North of the Netherlands
- 09:40 **Keynote: Massimo Cocco (INGV) & Beata Orlecka-Sikora (Polish Acad. Sci.)**
Implementing data provision and services for solid Earth sciences: the EPOS integrated approach

10:00 **Keynote: Domenico Giardini (ETHZ)**
A new Deep-UnderGround Laboratory infrastructure in Switzerland to validate the safe extraction of Deep Geothermal Energy

10:20 **Discussion**
Moderator: Ernest Majer (LBNL)

10:40 - 11:00 **Coffee break**

Final Discussion Final Discussion and Road Forward

11:00 **Stefan Wiemer (SED)**
Summary

11:10 **All**
Final discussion: community needs, next steps and road forward

from 12:30 **Lunch**

from 13:45 **Departure or free afternoon for snow activities**

List of Posters

**Coffee, wine,
cheese, and
posters**

Wednesday, 16:00 - 18:30

Thursday, 16:15 - 18.45

Plus

Posters are freely accessible during the entire workshop

Session 1 Extraction Plays

Oil and Gas, Coal Mining, Ground Water, etc.

S1P01 **Thomas Braun (INGV) et al.**

Reservoir induced/triggered seismicity: a Review

S1P02 **Alexey Konovalov (RAS) et al.**

Recent seismicity within the oil and gas fields' area in the northeastern offshore zone of Sakhalin Island (Russia)

S1P03 **Simon Kremers (DMT)**

Flooding of seismically active mine regions

S1P04 **Hiroshi Ogasawara (Ritsumeikan Univ.) et al.**

Stress and strength at seismic event hypocenters in deep south african gold mines and the m5.5 Orkney earthquake

Session 2 Injection Plays

Deep Geothermal, Waste Water Disposal, Fracking, CO₂ Storage

S2P01 **Mikel Diez (Univ. Bristol) et al.**

Rupture events inferred from the injection induced seismicity at Castor UGS, offshore Castellon, Spain

S2P02 **Thomas Goebel (Caltech) et al.**

A probabilistic assessment of waste water injection induced seismicity in central california

S2P03 **Bettina Goertz-Allmann (NORSAR) et al.**

Combined microseismic and geomechanical monitoring of a CCS site in algeria

S2P04 **Grzegorz Kwiatek (GFZ) et al.**

Changes in the characteristics of induced seismicity due to long-term fluid injection at The Geysers geothermal field: implications to fracture generation mechanism and seismic hazard

- S2P05 **Patricia Martínez- Garzón (GFZ) et al.**
Characterization of seismicity induced at variable injection rates: a case study from the geysers geothermal field
- S2P06 **Jack Norbeck (Univ. Stanford) et al.**
Thermal stress as a mechanism for injection-triggered seismicity
- S2P07 **Joachim Ritter (KIT) et al.**
Fault reactivation by fluid injection near Landau and Insheim, Upper Rhine Graben, Germany
- S2P08 **Bernd Schmidt (LER Mainz) et al.**
Detection and location of induced earthquakes at the Landau and Insheim geothermal reservoirs, SW Germany
- S2P09 **Ulrich Wegler (BGR) et al.**
Real time detection and traffic light systems for hydraulic stimulations

Session 3 Modeling of Induced Seismicity

Numerical Modeling, Geomechanical Aspects, and Physical Constrains

- S3P01 **Loes Buijze (TNO) et al.**
Dynamic rupture modeling of injection-induced seismicity
- S3P02 **Flaminia Catalli (GFZ) et al.**
Testing and comparing forecasting models for fluid-induced seismicity
- S3P03 **Rajdeep Deb (ETHZ) et al.**
Numerical modeling of injection induced seismicity in a damaged rock domain with fracture manifolds
- S3P04 **Pierre Dublanchet (SED) et al.**
Pressure front interacting with a rate-and-state fault of heterogeneous permeability
- S3P05 **Valentin Gischig (ETHZ) et al.**
A coupled fluid flow–seismicity model for real-time assessment of induced seismic hazard and reservoir creation
- S3P06 **Amir Hossein Hakimhashemi (GFZ) et al.**
Forward induced seismic hazard assessment – fisha application to the synthetic seismicity catalogue by discrete element fluid injection modeling

- S3P07 **Eszter Király (SED) et al.**
Developing a test bench for induced seismicity modelling in deep geothermal energy projects
- S3P08 **Antonio Rinaldi (SED) et al.**
3d modeling of fault reactivation during CO₂ injection
- S3P09 **Toshiko Terakawa (Nagoya Univ.) et al.**
Evolution of pore fluid pressures in a stimulated geothermal reservoir inferred from earthquake focal mechanisms
- S3P10 **Sergey Turuntaev (MIPT) et al.**
Rate-and-state model of induced seismicity
- S3P11 **Luca Urpi (Univ. Utrecht)**
Fault reactivation due to fluid injection: fault friction and slip distance
- S3P12 **Mirko van der Baan (Univ. Alberta) et al.**
Induced seismicity due to anthropogenic activities: when does it happen (and when not)?
- S3P13 **Andreas Wüstefeld (NORSAR) et al.**
Performance comparison of surface and downhole monitoring systems in complex velocity models using synthetic waveforms
- S3P14 **Jeoung Seok Yoon (GFZ) et al.**
Discrete element modeling of fluid injection induced seismicity and fault zone slip

Session 4 Scaled Experiments

Underground Labs, Petrophysical Labs

- S4P01 **Vincenzo Convertito (INGV Italy) et al.**
Earthquake source parameters and scaling relationships at The Geysers geothermal field, California
- S4P02 **Valentin Gischig (ETHZ) et al.**
Small-scale reservoir stimulation experiments in the deep underground laboratory at the Grimsel test site
- S4P03 **Wolfgang Lenhardt (ZAMG)**
Rockbursts at great depth
- S4P04 **Katrin Plenkers (GMuG) et al.**
In-situ observation of micro-crack evolution during large-scale gas-loading experiment

Session 5 Risk Governance, Societal Acceptance, and Licence to Operate

- S5P01 **Marco Broccardo (ETHZ) et al.**
Risk pre-assessment for an induced seismicity experiment in the dug lab: hazard, consequence and dependency mapping

Session 6 Monitoring and Analysis of Induced Seismicity

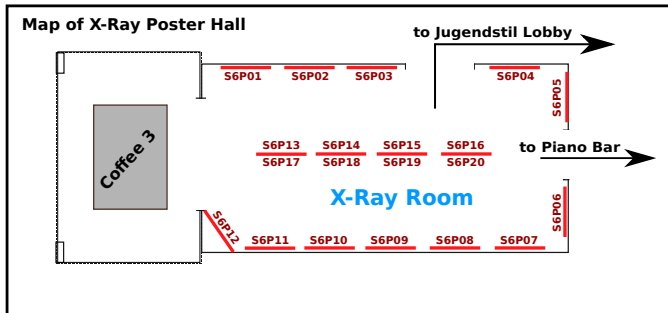
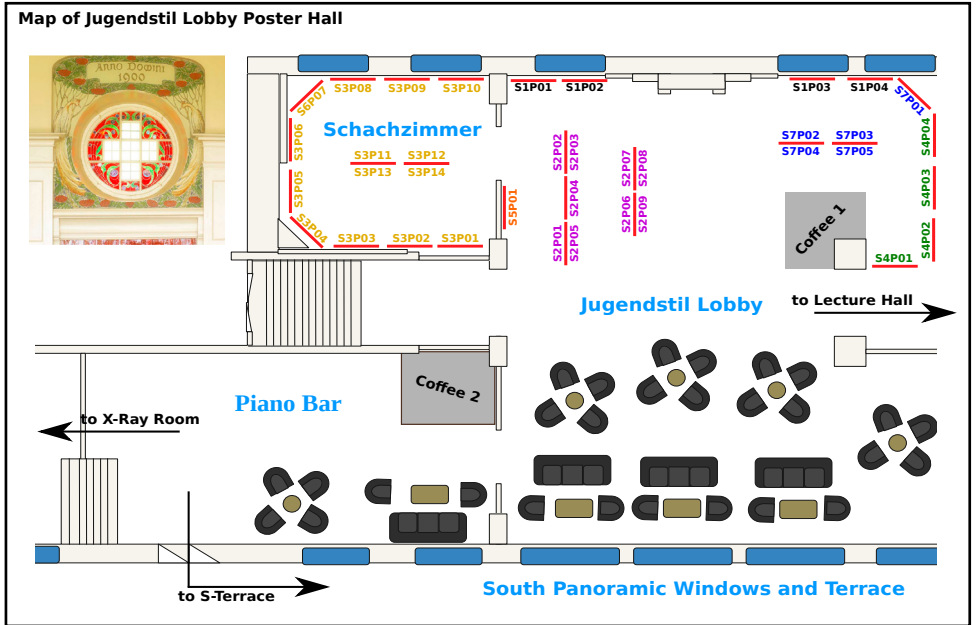
- S6P01 **Ortensia Amoroso (Univ. Naples) et al.**
4d imaging of elastic/anelastic medium properties: application to The Geysers geothermal area
- S6P02 **Martin Bachura (Charles Univ.) et al.**
Velocity ratio variations in the source region of earthquake swarms revisited: application to 2011 and 2014 sequences in west bohemia using waveform cross correlations
- S6P03 **Andreas Barth (KIT) et al.**
Magnitude-frequency distribution of induced and tectonic seismicity in the Upper Rhine Graben/Germany
- S6P04 **Antony Butcher (Univ. Bristol) et al.**
Site effects and their impact on microseismic surface arrays
- S6P05 **Alexander Caneva (UNAL) et al.**
Analysis of sources and possible effects of anthropogenic seismicity in Argentina, Colombia and Mexico
- S6P06 **Tobias Diehl (SED) et al.**
The 2013 Ml 3.5 earthquake sequence of St. Gallen (Switzerland): a mesozoic fault system activated by stimulations of a geothermal reservoir
- S6P07 **Paul Friberg (ISTI) et al.**
Cross-correlation traffic light systems for induced seismicity; an example of an operational single station detector in ohio
- S6P08 **Benjamin Homuth (Goethe Univ.) et al.**
Microseismic monitoring in advance of geothermal projects in the northern upper-rhine graben: borehole noise studies and swarm events
- S6P09 **Daniela Kühn (NORSAR) et al.**
Feasibility of using ambient seismic noise for CCS monitoring

- S6P10 **Yusuke Mukuhira (SED)**
New seismic risk assessment: evaluation of the cumulative fault area under critical state based on microseismic information
- S6P11 **Emilia Ndemuweda (LTU) et al.**
Evaluation of seismic source parameters and short-term seismic hazard for rock bursts in deep underground mines (Ikab, Kirunavaara mine, Sweden)
- S6P12 **Kai Olbert (Univ. Kiel) et al.**
Automatic p- and s-phase travel-time determination of induced events based on an ar-aic-costfunction approach
- S6P13 **Elmer Ruigrok (Utrecht Univ.) et al.**
Tremor mapping at the groningen field
- S6P14 **Martin Schönball (Temple Univ.) et al.**
Swarm or induced: comparing natural and induced seismicity at the Coso geothermal field
- S6P15 **Jan Sileny (Acad. Sci. Prague)**
Shear-tensile/implosion source model vs. moment tensor: benefit in single-azimuth monitoring. Case study of cotton valley hydrofracture treatment
- S6P16 **Rob Skoumal (Miami Univ.) et al.**
Optimizing multi-station template matching to characterize induced seismicity
- S6P17 **Anna Stork (Univ. Bristol) et al.**
Preliminary analysis of the aquistore, boundary dam carbon capture and storage project passive seismic data
- S6P18 **Philip Usher (Univ. Bristol) et al.**
Understanding the role of fractures in hydraulic stimulation from anisotropic attenuation measurements of microseismic waveforms
- S6P19 **Josef Vitek (Charles Univ.) et al.**
Time reversal stacking of p and s waves to determine location and focal mechanism of microseismic events recorded during hydraulic stimulation
- S6P20 **Matthew Wilks (Univ. Bristol) et al.**
Monitoring geothermal systems on an actively deforming volcano

Session 7 Industry Projects and Future Initiatives

- S7P01 **Andrew Jupe (Altcom Ltd.)**
The role of probability based models in egs hazard assessment
- S7P02 **Adam Baig (ESG Canada Inc.)**
Empirical ground motion prediction equation for induced seismicity related to hydraulic fracture stimulation
- S7P03 **Falko Bethmann (Geo-Energie Suisse AG) et al.**
Seismic risk analysis for the egs pilot-project in the community of Haute-Sorne, Switzerland
- S7P04 **Volker Oye (NORSAR) et al.**
On decision-criteria for the identification of microseismic events using migration-based methods
- S7P05 **Zbigniew Zembaty (Opole Univ.)**
Can induced ground motion be applied as a viable structural load in seismic engineering?

Map of Poster Halls



Legend

- Poster board with poster ID
- Session colors
- Coffee 2
- coffee, wine & cheese tables
- Get-together & chill-out area

List of Participants

Last updated on March 3, 2015

Alcolea Rodriguez	Andres	TK Consult AG
Amann	Florian	ETH Zurich
Amoroso	Ortensia	University of Naples, Amra Scarl
Ampuero	Jean Paul	California Institute of Technology
Anselmi	Mario	INGV
Bachura	Martin	Charles University in Prague
Baig	Adam	ESG Canada Inc
Baisch	Stefan	Q-con GmbH
Baker	Jack	Stanford University
Barth	Andreas	Karlsruhe Institute of Technology
Becker	Dirk	Hamburg University
Benson	Philip	Portsmouth
Beroza	Greg	Univ. Stanford
Bethmann	Falko	Geo-Energie Suisse AG
Bischoff	Monika	Landesamt für Bergbau, Energie und Geologie
Blascheck	Patrick	Universität Stuttgart
Bohnhoff	Marco	GFZ Potsdam
Bokelmann	Götz	University of Vienna
Bönnemann	Christian	BGR
Braun	Thomas	INGV
Broccardo	Marco	ETH Zurich
Brodsky	Emily	UC Santa Cruz
Buijze	Loes	TNO / Utrecht University
Busch	Sebastian	Geologischer Dienst Nordrhein-Westfalen
Butcher	Antony	University of Bristol
Buttinelli	Mauro	INGV
Caneva	Alexander	Antonio Narino University
Catalli	Flaminia	GFZ-Potsdam
Chiarabba	Claudio	INGV
Clinton	John	Swiss Seismological Service
Cocco	Massimo	INGV
Convertito	Vincenzo	INGV
Dahm	Torsten	GFZ German Research Centre For Geosciences
DeDontney	Nora	ExxonMobil
De Simone	Silvia	Universitat Politecnica de Catalunya UPC
Deb	Rajdeep	ETH Zurich
Deichmann	Nicholas	Swiss Seismological Service
del Potro	Rodrigo	University of Bristol
Devanney	Peter	Nanometrics
Diehl	Tobias	Swiss Seismological Service
Dineva	Savka	Luleå University of Technology
Doetsch	Joseph	ETH Zurich
Dost	Bernard	KNMI

Dresen	Georg	GFZ Potsdam
Dublanchet	Pierre	Swiss Seismological Service
Edwards	Benjamin	Swiss Seismological Service
Eisner	Leo	IRSM ASCR
Ellsworth	William	USGS
Esposito	Simona	ETH Zurich
Fischer	Tomas	Charles University in Prague
Friberg	Paul	ISTI
Fritschen	Ralf	DMT
Galanis	Panagiotis	ETH Zurich
Gasparini	Paolo	AMRA
Gaucher	Emmanuel	KIT - CS
Gehne	Stephan	University of Portsmouth
Genoni	Oliver	Geo Explorers Ltd.
Gestermann	Nicolai	BGR
Giardini	Domenico	ETH Zurich
Gischig	Valentin	ETH Zurich
Goertz-Allmann	Bettina	NORSAR
Gómez Castro	Berta María	Consejo Superior de Investigaciones Científicas
Green	Alan	ETH Zurich
Homuth	Benjamin	Goethe University Frankfurt
Improta	Luigi	INGV
Iranpour	Kamran	Norsar
Jalali	Mohammadreza	ETH Zurich
Jechumtálová	Zuzana	Seismik s.r.o.
Joswig	Manfred	Universität Stuttgart
Jupe	Andrew	Altcom Ltd.
Kao	Honn	Geological Survey of Canada
Karvounis	Dimitrios	Swiss Seismological Service
Kiraly	Eszter	Swiss Seismological Service
Koller	Martin	Resonance
Konovalov	Alexey	IMGG
Kraaijpoel	Dirk	KNMI
Kraft	Toni	Swiss Seismological Service
Kremers	Simon	DMT
Kühn	Daniela	NORSAR
Kwiatek	Grzegorz	GFZ Potsdam
Lasocki	Stanislaw	Polish Acad. Sci.
Lenhardt	Wolfgang	Zentralanstalt für Meteorologie und Geodynamik
Lund	Björn	Uppsala University
Madonna	Claudio	ETH Zurich
Main	Ian	University of Edinburgh
Martínez-Garzón	Patricia	GFZ Potsdam
Marzocchi	Warner	INGV
Maxwell	Shawn	ImaGE
McClure	Mark	UT Austin
Meier	Peter	GeoEnergie Suisse AG

Meier	Men-Andrin	Swiss Seismological Service
Mikel	Diez	Univ. Bristol
Minnig	Christian	Swisstopo
Mokelke	Gregor	Stuttgart University
Molinari	Jean-Francois	EPFL
Mukuhira	Yusuke	Tohoku Univ.
Muntendam-Bos	Annemarie	State Supervision of Mines
Nannizzi	Massimo	Misure Meccaniche srl
Ndemuweda	Emilia	Luleå University of Technology
Norbeck	Jack	Stanford University
Ogasawara	Hiroshi	Ritsumeikan University
Olbert	Kai	Christian-Albrechts-University Kiel
Ollinger	Dieter	Geo-Energie Suisse AG
Oncescu	Lani	Kinematics, Inc.
Orleka-Sikora	Beata	Polish Acad. Sci.
Oye	Volker	NORSAR
Philipp	Joachim	GmuG
Plenefisch	Thomas	BGR Hannover
Plenkers	Katrin	GmuG
Primiero	Paolo	Schlumberger
Rinaldi	Antonio Pio	Swiss Seismological Service
Ritter	Joachim	Karlsruhe Institute of Technology
Roth	Philippe	Proseis AG
Rubinstein	Justin	USGS
Ruigrok	Elmer	Utrecht University
Ruiz Barajas	Sandra	Polytechnic University of Madrid
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