

Personal Information **Francesco Grigoli**



Address: Via dei Giuliani 31, 34137, Trieste, Italy

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Date of birth: 22/01/1984

Nationality: Italian

Sex: Male

Work Experience

08/2015-PRESENT DAY **Researcher**

National Institute of Geophysics and Oceanography, OGS
Seismological section, Trieste, Italy .

Main Tasks:

Development of methods/software for real-time analysis of induced seismicity related to different industrial operations (gas storage, oil extraction, mining etc.)

Research Interests:

Induced seismicity
Microseismic monitoring methods
Moment tensor inversion
Seismic signal processing
Seismic interferometry
Reflection seismology
Surface wave inversion
Scientific computing
Parallel programming

07/2012-06/2015 **Researcher**

Institute of Earth and Environmental Sciences,
University of Potsdam, Germany.

Main Tasks:

Development of methods/software for automated detection and locations of microseismic events.
Analysis of induced seismicity related to different industrial operations (gas storage, oil extraction, mining etc.)

07/2010-06/2012 **Researcher**

Institute of Geophysics,
University of Hamburg, Germany.

Main Tasks:

Development of waveforms stacking methods (and software) for automated detection and locations of mining induced microseismic events.

Education

01/2011-03/2014 **Ph.D in Geophysics (Seismology)**

Institute of Earth and Environmental Sciences,
University of Potsdam/GFZ, Germany.

Thesis title:

"Automated seismic event location by waveform coherence analysis"

Supervisor:

Prof. Dr. Torsten Dahm

Final grade:

Magna cum laude

09/2007-05/2010 **M.Sc in Exploration Geophysics**

University of Pisa, Italy.

Thesis title:

"Inversion of surface waves using Genetic Algorithms"

Final grade:

110/110 with distinction

Main subjects:

Reflection seismology

Applied geophysics

Signal processing

Seismic data processing

Numerical methods for geophysics

Inverse Problems

09/2003-07/2007 **B.Sc in Geosciences**

University of Palermo, Italy.

Thesis title:

"Physics of seismic sources and determination of earthquakes focal mechanisms "

Final grade:

110/110 with distinction

- 25-30/05/2012 **38th International School of Geophysics**
 Ettore Majorana Centre for Scientific Culture, Erice (TP), Italy.
Topic of the school:
 Global Challenges for Seismological Data Analysis
- 07-18/09/2009 **Cineca Summer School of Parallel Computing**
 Cineca, Casalecchio di Reno (BO), Italy.
Main subjects covered:
 Parallel architectures
 Parallel algorithms
 Parallel programming using MPI and OpenMP
 Debugging techniques
 Optimization of parallel codes
- 06-07/06/2009 **SEG/ExxonMobil Student Education Program (SEP)**
 Society of Exploration Geophysicists and ExxonMobil
Main subjects covered:
 One day course covering the acquisition, processing and interpretation of seismic reflection data for oil and gas exploration.

Personal Skills

Languages

Italian	Mother tongue
English	Fluent
French	Basic knowledge

Technical Skills Experience in acquisition and processing of both active and passive seismic data.
 Experience in installation and maintenance seismic stations

Computer Skills Knowledge of both UNIX/LINUX and Windows based OSs.
 Proficiency with the following programming language:
 C, FORTRAN90/95, Python.
 Knowledge of shell scripting (mainly Bash and TCSH)
 Experience in code parallelization using both distributed (MPI) and shared (openMP) memory paradigms.
 Experience in software development
 Knowledge of the main programs used for seismic and seismological applications (SAC, HypoEllipse, SeismicUnix, FPFIT, QSEIS, KIWItools)

Additional Information

Publications **Peer reviewed ISI papers:**

1. **Grigoli, F.**, Cesca, S., Dahm, T., Krieger, L. 2012, A complex linear least-squares method to derive relative and absolute orientations of seismic sensors. *Geophysical Journal International*. Doi: 10.1111/j.1365-246X.2011.05316.x
2. **Grigoli, F.**, Cesca, S., Vassallo, M., Dahm, T. 2013, Automated seismic event location via traveltimes stacking: An application to mining induced seismicity, *Seismological Research Letters*, Doi: 10.1785/0220120191
3. **Grigoli, F.**, Cesca, S., Amoroso, O., Emolo, A., Zollo, A., Dahm, T. 2014, Automated seismic event location by waveform coherence analysis, *Geophysical Journal international*. Doi: 10.1093/gji/ggt477
4. Cesca, S., **Grigoli, F.**, Heimann, S., Gonzalez, A., Bufo, E., Maghsoudi, S., Blanch, E., Dahm, T. 2014, The September-October 2013 seismic sequence offshore Spain: a case of seismicity triggered by gas injection?, *Geophysical Journal international*. Doi: 10.1093/gji/ggu172
5. Krieger, L., **Grigoli, F.**, 2015, Optimal reorientation of geophysical sensors: a quaternion based analytical solution, *Geophysics*, Doi:10.1190/GEO2014-0095.1
6. Cesca, S., **Grigoli, F.**, 2015, Full-waveform seismological advances in microseismic monitoring , chapter of the book *Advances in Geophysics*, Vol 56, ISSN 0065-2687, Elsevier, Doi: 10.1016/bs.agph.2014.12.002
7. Cesca, S., **Grigoli, F.**, Heimann, S., Dahm, T., Sobiesiak, M., Tassara, C., Olcay, M. 2015, The Mw 8.1 2014 Iquique, Chile, seismic sequence: a tale of foreshocks and aftershocks, *Geophysical Journal International* (accepted).
8. Diez, E., Priolo E., **Grigoli, F.**, Cesca S. 2015 Misalignment angle correction of borehole seismic sensors – The case study of the Collalto Seismic Network, *Seismological Research Letters* (accepted).
9. **Grigoli F.**, Cesca S., Krieger L., Priolo E., Dahm. T. 2015, Automated microseismic event location using Master-Event Waveform Stacking, *Scientific reports*, Nature Publishing Group (submitted)

Technical papers and reports:

1. Cesca, S., **Grigoli, F.**, Sen, A., T., Maghsoudi, S., Dahm, T., and Meier, T. 2014, The MINE project: Monitoring induced seismicity in a German coal mine, chapter of the book "Tomography of the Earth's Crust - From Geophysical Sounding to Real-Time Monitoring", *Geotechnologies Science reports* n. 21, Springer, ISBN 978-3-319-04204-6.

Selected abstracts and contributions to conferences:

I have presented more than 20 contributions to different international scientific conferences. Here below are listed only selected contributions:

1. **Grigoli, F.**, Cesca, S., Dahm, T., 2011, Optimized detection and location of microearthquakes using a single vertical array in a deep borehole, *EGU, General Assembly*, Vienna, Austria.
2. **Grigoli, F.**, Cesca, S., Braun, T., Philipp, J., Dahm, T., 2012, Automated seismic event location by arrival time stacking: Applications to local and micro-seismicity, *EGU General Assembly*, Vienna, Austria.
3. **Grigoli, F.**, Cesca, S., Dahm, T., 2012, Automated seismic event location by arrival time stacking: an application to mining induced seismicity, *ESC 33rd General Assembly*, Moscow, Russia.
4. **Grigoli, F.**, Cesca, S., Dahm, T., 2013, An automated local and regional seismic event location method based on waveform stacking, *AGU Fall Meeting 2013*, San Francisco, United States.
5. **Grigoli, F.**, Cesca, S., Krieger, L., Olcay, M., Tassara, C., Sobiesiak, M., Dahm, T., 2014, Seismic Sensor orientation by complex linear least squares, *EGU General Assembly*, Vienna, Austria, **(Invited talk)**.
6. Gammaldi, S., **Grigoli, F.**, Cesca, S., Saccorotti, G., Horalek, J., 2014, Automated Master Event Full Waveform Location, An Application to NW Bohemia, *EGU, General Assembly*, Vienna, Austria.
7. Cesca, S., **Grigoli, F.**, Heimann, S., Gonzalez, A., Bufo, E., Maghsoudi, S., Blanch, E., Dahm, T., 2014, The 2013 seismic sequence close to gas injection platform of the Castor project, offshore Spain, *EGU General Assembly*, Vienna, Austria.
8. **Grigoli, F.**, Cesca, S., Sens-Schoenfelder, C., Priolo, E., 2014, Monitoring gas reservoirs by seismic interferometry, *EGU General Assembly*, Vienna, Austria.
9. Cesca, S., **Grigoli, F.**, Heimann, S., Gonzalez, A., Bufo, E., Maghsoudi, S., Blanch, E., Dahm, T., 2014, The 2013 seismic sequence close to gas injection platform of the Castor project, offshore Spain, *Seismological Society of America Annual Meeting*, Anchorage, Alaska, USA, **(Invited talk)**.
10. **Grigoli, F.**, Cesca, S., Dahm, T., 2014, Waveform stacking location methods for microseismic monitoring operations, Geo.X Workshop on Physics and Statistics of triggered and induced seismicity, Free University of Berlin, Germany.
11. **Grigoli, F.**, Cesca, S., Dahm, T., Hainzl, S., 2014, Analysis of seismicity and stress before and after the Mw 8.1 Pisagua, Chile, 2014 earthquake, *AGU Fall Meeting 2014*, San Francisco, United States.

Others **Awards and Grants:**

1. Winner of a research grant within the FP7 European project NERA: Network of European Research Infrastructures for Earthquake Risk Assessment and Mitigation (host institution: Univ. of Naples Federico II).
2. Honorable mention GFZ PhD Publication Award 2014
3. Winner (1st place) of the Italian SEG Challenge Bowl held in Trieste (Italy), during the 27th annual meeting of the National Group of Solid Earth Geophysics (6/10/2008).
4. SEG Student Leadership Symposium travel grant to the 79th SEG annual meeting and 3rd place at the world final SEG Challenge Bowl held in Houston (26/10/2009).

Referee for the following ISI journals:

Journal of Seismology
Geophysical Journal International
Gondwana Research
Annals of Geophysics
Scientific Reports

Invited seminars at the following institutions:

University of Naples Federico II, Italy
OGS Trieste, Italy
University of Palermo, Italy
University of Tokyo, Japan
Earthquake Research Institute, Tokyo, Japan

Teaching experience:

Lecture assistant for the Digital Seismology course held by Prof. T. Dahm, within the M.Sc program in Geosciences of the University of Potsdam (from 10/04/2013 to 10/07/2013).
Thesis co-supervisor of Mr. Sergio Gammaldi (now PhD in Geophysics at University of Naples Federico II), within the M.Sc degree course in Exploration Geophysics at University of Pisa, July 2014.

Memberships:

Seismological Society of America (SSA)
Society of Exploration Geophysicists (SEG)