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EGU2012 SM1.3/GI1.7 session: "Improving seismic networks performances: from site selection to data integration"

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Abstract. The number and quality of seismic stations and networks in Europe continually improves, nevertheless there is always scope to optimize their performance. In this session we welcome contributions from all aspects of seismic network installation, operation and management. This includes site selection; equipment testing and installation; planning and implementing communication paths; policies for redundancy in data acquisition, processing and archiving; and integration of different datasets including GPS and OBS.

1 Introduction

The history of seismic network sessions at European Geosciences Union (EGU) General Assemblies started in 2010 with the SM1.3 "Seismic Centers Data Acquisition" session (Pesaresi, 2011 and SM1.3 Seismic Centers Data Acquisition, 2010), where the Convener Damiano Pesaresi supported by the ODC Director Co-Convener Reinoud Sleeman chaired a session of 7 oral and 16 posters. A similar session was later the same year held at the XXXII European Seismological Commission (ESC) General Assembly: "SD1, 3 Seismic centers data acquisition", conveners D. Pesaresi and R. Sleeman, with 15 oral presentations.

The history continues in 2011 with the SM1.3/G3.8/GD3.7/GI-19/TS8.7 "Improving seismic networks performances: from site selection to data integration" session (SM1.3/G3.8/GD3.7/GI-19/TS8.7 Improving seismic networks performances: from site selection to data integration, 2011) where the Convener Damiano Pesaresi supported by the Co-Conveners John Clinton and Robert Busby chaired a session of 9 oral and 20 posters.

2 The EGU2012 SM1.3/GI1.7 session

In the EGU2012 SM1.3/GI1.7 "Improving seismic networks performances: from site selection to data integration" session (SM1.3/GI1.7 Improving seismic networks performances: from site selection to data integration, 2012) the Convener Damiano Pesaresi supported by the Co-Convener Frank Vernon chaired a session (Fig. 1) of 6 oral (Table 1) and 22 posters (Table 2).

The 28 presentations comes from 13 countries (USA, Ireland, Switzerland, UK, Saudi Arabia, Egypt, Austria, Japan, Slovenia, Italy, Finland, Greece, France) from 4 different continents (North America, Europe, Africa and Asia), which well fits the goals of the European Geosciences Union.

Presentations worth mentioning in the session were:

1. "Integration of Infrasound, Atmospheric Pressure, and Seismic Observations with the NSF EarthScope US-Array Transportable Array", by F. Vernon, J. Tytell, M. A. H. Hedlin, K. Walker, R. Busby, and R. Woodward (Vernon et al., 2012), which demonstrated the overall viability of the USArray Transportable Array network for monitoring severe weather events in real-time;

2. "AlpArray – technical strategies for large-scale European co-operation in broadband seismology", by A. Brisbourne, J. Clinton, G. Hetenyi, C. Pequegnat, M. Wilde-Piorko, A. Villasenor, P. Comelli, and the AlpArray Working Group (Brisbourne et al., 2012), which illustrated the state-of-the art in organization and subprojects definition of the AlpArray new initiative to study the greater Alpine area with a large-scale broadband seismological network;

Table 1. Oral Programme SM1.3/GI1.7.

EGU Abstract ref.	Title	Authors
EGU2012-10770	Integration of Infrasound, Atmospheric Pressure, and Seismic Observations with the NSF Earth-Scope USArray Transportable Array	F. Vernon, J. Tytell, M. A. H. Hedlin, K. Walker, R. Busby, and R. Woodward
EGU2012-3615	Ireland Array: A new broadband seismic network targets the structure, evolution and seismicity of Ireland and surroundings	S. Lebedev, C. Horan, P. W. Readman, A. J. Schaeffer, M. R. Agius, L. Collins, F. Hauser, B. M. O'Reilly, and T. Blake
EGU2012-7107	Optimizing Site Selection in Urban Areas in Northern Switzerland	K. Plenkers, T. Kraft, F. Bethmann, S. Husen, and M. Schnellmann
EGU2012-3881	A Technique to Determine the Self-Noise of Seismic Sensors for Performance Screening	H. Rademacher, D. Hart, and C. Guralp
EGU2012-11345	AlpArray – technical strategies for large-scale European co-operation in broadband seismology	A. Brisbourne, J. Clinton, G. Hetenyi, C. Pequegnat, M. Wilde-Piorko, A. Villasenor, P. Comelli, and the AlpArray Working Group

Fig. 1. EGU2012 SM1.3/GI1.7 session (from EGU2012 Homepage).

Table 2. Poster Programme SM1.3/GI1.7.

EGU Abstract ref.	Title	Authors
EGU2012-1077	Seismic noise study for a new seismic station at King Fahd University of Petroleum and Minerals in Saudi Arabia	S. I. Kaka
EGU2012-2272	Role of the Egyptian National Seismological Network to mitigate the seismic hazard in Egypt	A.-A. Mohamed
EGU2012-2614	Improving identification of regional depth phases in sparse networks	M.-T. Apoloner and G. Bokelmann
EGU2012-3072	HIGH-RESOLUTION, LOW POWER, INTERGRATED AFTERSHOCK and MICROZONATION SYSTEM	Dr. L. Zimakov and P. Passmore
EGU2012-3376	Autonomous telemetry system by using mobile networks for a long-term seismic observation	S. Hirahara, N. Uchida, and J. Nakajima
EGU2012-3924	Site effects in seismic data acquisition	Y. Jia, N. Horn, and W. Lenhardt
EGU2012-6598	Local magnitude scale in Slovenia	J. Bajc, Ž. Zaplotnik, M. Živčić, and M. Čarman
EGU2012-7310	OGS improvements in the year 2011 in running the North-eastern Italy Seismic Network	P. L. Bragato, D. Pesaresi, A. Saraò, P. Di Bartolomeo, and G. Durì
EGU2012-7717	Geophysical monitoring of a complex geologic framework: the multi-disciplinary sensor networks in Sicily (Italy)	M. Cantarero, S. Di Prima, M. Mattia, D. Patanè, and M. Rossi
EGU2012-7830	Kurtosis based automated P-S phase picking procedure for hypocenter determination: Vanuatu region case study	C. Baillard, W. Crawford, V. Ballu, and C. Hibert
EGU2012-8121	Simulations of a Microearthquake Network	O. Valtonen, M. Uski, A. Korja, T. Tiira, and J. Kortström
EGU2012-8654	S-onset time automatic picking based on polarization analysis and higher order statistics	A. Lois, E. Sokos, P. Paraskevopoulos, and G.-A. Tselentis
EGU2012-9374	Broad-band seismometers in the extreme cold: what we learn from the observatory station CCD (Concordia, Antarctica)	J.-J. Lévêque, M. Bès de Berc, A. Maggi, and J.-Y. Thoré
EGU2012-9468	Comparison of manual and automatic onset Time picking for local earthquake in North Eastern Italy	D. Spallarossa, L. Tiberi, and G. Costa
EGU2012-9523	The Athens Acropolis Strong Motion Array	I. S. Kalogeras, C. P. Evangelidis, N. S. Melis, and K. Boukouras
EGU2012-9764	Rigorous noise test and calibration check of strong-motion instrumentation at the Conrad Observatory in Austria	R. Steiner, G. Costa, W. Lenhardt, N. Horn, and P. Suhadolc
EGU2012-10922	Continuous GPS observations in Tohoku University and recovery effort after the 2011 off the Pacific coast of Tohoku Earthquake	T. Demachi, S. Miura, Y. Ohta, K. Tachibana, S. Ueki, T. Sato, M. Ohzono, and N. Umino
EGU2012-11006	A new integrated approach to seismic network optimization	A. Tramelli, G. De Natale, C. Troise, and M. Orazi
EGU2012-11620	A noise comparison between two different types of sensor installation	M. Langlais, B. Vial, and O. Coutant
EGU2012-12370	Moment Tensor code for the Antelope Environmental Monitoring System	J. Reyes, R. Newman, F. Vernon, and G. van den Hazel
EGU2012-12521	Evaluation results after seven years of operation for the permanent Hellenic Seismological Network of Crete (HSNC)	F. Vallianatos, G. Hloupis, and I. Papadopoulos

3. “Site effects in seismic data acquisition”, by Y. Jia, N. Horn, and W. Lenhardt (Jia et al., 2012), which shows how seismic signals depend on site effects, comparing recordings from three co-located seismic stations with different conditions: in a tunnel, free field and in a borehole;

4. “Broad-band seismometers in the extreme cold: what we learn from the observatory station CCD (Concordia, Antarctica)”, by J.-J. Lévêque, M. Bès de Berc, A. Maggi, and J.-Y. Thoré (Lévêque et al., 2012), which illustrates calibration and operation of very broad band seismometers at very severe conditions in Antarctica with temperatures down to -54°.

The papers published in these proceedings of the EGU2012 SM1.3/GI1.7 session are:

1. “OGS improvements in the year 2011 in running the Northeastern Italy Seismic Network”, by P. L. Bragato, D. Pesaresi, A. Saraò, P. Di Bartolomeo and G. Durì, which shows the improvements made by OGS in terms of long period noise reduction and data link reliability in running a seismic network;

2. “Optimal configuration of a micro-earthquake network”, by O. Valtonen, M. Uski, A. Korja, T. Tiira, and J. Kortström, which illustrates the method applied to plan a micro-earthquake network to monitor a power plant;

3. “Improvement of broadband seismic station installations at the Observatoire de Grenoble (OSUG) seismic network”, by M. Langlais, B. Vial, and O. Coutant, which illustrates the improvement made at seismic network site to reduce long period noise above 20 seconds;

4. “The South Aegean Seismological Network – HSNC”, by G. Hloupis, I. Papadopoulos, J. P. Makris and F. Vallianatos, which illustrates the installation and the technology applied for the operation of the Hellenic Seismological 12 Network of Crete (HSNC);

5. “Local magnitude scale in Slovenia”, by J. Bajc, Z. Zaplotnik, M. Zivcic, and M. Carman, which illustrates a calibration study of the local magnitude M_{LV} scale in Slovenia;

6. “Seismic noise study for a new seismic station at King Fahd University of Petroleum and Minerals in Saudi Arabia”, by S. I. Kaka, which illustrates a seismic noise study to select a suitable site for a new broad band seismic station.

3 Conclusions

The quality and quantity of presentations made at the EGU2012 SM1.3/GI1.7 session well satisfied the expectations of the Convener and Co-Convener, and well fitted the goals of the European Geosciences Union.

The steady number of presentation at such yearly seismic networks sessions encourage the conveners that the path they followed in organizing such sessions is a valid one, and that there is need in the seismological community worldwide to present and discuss different solutions to common problems in running seismic networks.

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