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ABSTRACT BOOK

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Seismic swarm that occurred in Kraslice area, West Bohemia, in 2008, represents the most significant seismic loading of this area from 1985/1986. Study of this swarm is performed by staff of Geophysical Institute of the ASCR, Prague. About 35 km from this source area, large medieval mine named Jeroným is situated (Sokolov District). The Jeroným Mine is declared as National Cultural Heritage Site of the Czech Republic. This medieval mining locality is not open for public in the present time but in connection with the assumed utilization of the mine for the purpose of tourism, in 2001, works started to obtain more objective and specific information about the stress-strain and stability state of this shallow mine. Interpretation of seismic events recorded during period 2006-2009 shows that it is possible to divide records into following groups:
• blasting operations from adjacent quarries,
• traffic – road above the mine,
• earthquakes – intensive distant,
• microearthquakes from North-West Bohemia,
• other seismic events – e.g. mining induced seismic events from Lubin. In sum 451 earthquakes from Nový Kostel area were recorded on seismic station Jeroným within 6 Oct. –10 Dec., 2008. The most intensive shock occurred on 14 Oct (21:00); maximum value of component velocity reached 0.435 $mm.s^{-1}$. Damages of underground spaces (i.e. cracking of pillars, opening of observed fissures and discontinuities, more significant breaking off rock from the ceilings and walls …) were not visually observed during quarterly experimental geomechanical monitoring in autumn 2008 and spring 2009.

ES3/P11/ID86 – TIME VARIATIONS OF AFTERSHOCK DECAY PARAMETERS OF THE APRIL 6, 2009 L'AQUILA (CENTRAL ITALY) EARTHQUAKE: EVIDENCE OF THE EMERGENCE OF A NEGATIVE EXPONENTIAL REGIME SUPERIMPOSED TO THE POWER-LAW

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We studied the variations with time of decay properties of the L'Aquila aftershock sequence by considering time intervals of progressively increasing duration beginning at the main shock. In the first few days, the decrease of the rate appears very slow, compatible with an Omori's process with power-law exponent p≈0.5. The progressive increase of the exponent up to about p=1.2 in the following weeks can be interpreted as the emergence of a negative exponential regime that has been found to control the decay of other sequences occurred in Italy and California. In fact, two models that also include a negative exponential term reproduce the aftershock rate in the first 60 days significantly better than the Omori's law according to the Akaike information criteria. In this time interval, the evolution of the sequence does not show an evident epidemic character, as strongest aftershocks do not seem to have induced significant increases of the aftershock rate while a couple of them seem to be preceded, rather than followed, by a slight increase of the rate. About 80 days after main shock, the rate suddenly increased, after a relatively strong aftershock in the main fault area and the activation of a previously silent fault segment located at about 25 km from the main shock epicenter. A slow change of decay parameters seems to have preceded by few weeks this renewal of the rate. The L'Aquila main shock is one of the most productive ever observed in Italy, as it produced from 3 to 10 times more aftershocks that any previous earthquakes with similar magnitude.

ES3/P12/ID87 – AN IMPORTANT NUMBER OF RECENT SIGNIFICANT EARTHQUAKES IN GREECE

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Greece is characterized by high seismicity mainly due to the collision between the European and the African lithospheric plates. During the recent years strong earthquakes occurred in regions with different seismotectonic regimes. Moment tensor inversion was applied to determine the source properties, as well as the dynamic processes of these events. Waveforms recorded in teleseismic distances were used and P, SH and SV synthetic waveforms were calculated for the selected stations. The final solution is obtained by minimizing the difference between the observed and the synthetic waveforms. The obtained source parameters were compared to the seismotectonic characteristics of each seismogenic area. Slip models that were determined for the important events were used to compute the Static Coulomb Stress Changes. This computation was performed in order to examine possible stress transfer to a neighboring area or to explain the spatial distribution of certain aftershock sequences. No static stress transfer was revealed to the epicentral area of the 2008 Leonidion earthquake due to the occurrence of the 2006 Kythira earthquake. On the other hand, the aftershock distribution of the 2008 Andravida earthquake extended to an area significantly larger than the one expected according to the magnitude of the main event. On February 2008 an earthquake sequence including three strong events (Mw=6.7, 6.1 and 6.0) occurred South of Methoni, at a segment of the Hellenic arc which was not activated during the instrumental period. This sequence was followed by a large number of aftershocks, the strongest of which were processed to calculate their source parameters. The most recent significant events occurred north of Rhodes on 15 July 2008 (Mw=6.3) and south of Crete on 1 July 2009 (Mw=6.2). The first occurred at a depth of 55 km, was characterized by strike-slip faulting and followed by few aftershocks. On the contrary, the second one was followed by an important aftershock sequence with focal depths in the range of 10-30 km. The Crete earthquake was characterized by thrust faulting. Even though most of the above earthquakes are related to the Hellenic Arc, they are characterized by different seismotectonic features and stress regimes.

ES3/P13/ID88 – SURFICIAL CRACKS OBSERVED AFTER THE PARIAMAN (PADANG) AND KERINCI 2009 EARTHQUAKES, INDONESIA: RELATIONSHIP WITH THE NATURE OF SEISMIC WAVES

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On 30 September 2009 a 7.5 M_W devastating earthquake occurred as a result of oblique-thrust faulting near the subduction interplate boundary between the Australian and Sunda plates. Its epicentre located ~25 km WSW offshore Pariaman, West Sumatra. The published moment tensor solution suggests that a medium depth thrust fault striking NE-SW was the responsible trigger for the event, apparently perpendicular to the NW-SE striking subduction zone. This earthquake caused 1,117 fatalities and 3,942 collapsed constructions, including houses, medical facilities, government offices and bridges.

A day after the Pariaman earthquake, 1 October 2009, the Kerinci 6.6 M_W earthquake occurred as a result of shallow strike-slip in the Sumatra Fault Zone and damaged buildings and caused three fatalities. The epicentre was located near Lempur Hilir, about 40 km south of Kerinci Lake. The published moment tensor solution suggests that a shallow depth fault striking NW-SE was the responsible trigger for the event, which has good agreement with the Sumatra Fault Zone striking NW-SE. Although the Kerinci earthquake was shallow and strong, surprisingly it did not produce extensive damage. Sungai Penuh has a population of 95,000, is capital of Kerinci Regency, and is the nearest town to the epicentre, yet it did not experience any damage and people in the town hardly felt any strong ground motion.

One method to study the nature of earthquake is through examining surface cracks. Examining systematic cracks at the soil surface, asphalt roads and bridges will inform how the seismic waves propagate to deliver damaging forces. Observations (Pariaman earthquake) made on a basketball field and adjacent Junior High School of Enam Lingkung District, Padang Pariaman Regency, which is built on thick Quaternary volcanic deposits, revealed that the ground floor had a crack system aligned NNW-SSE across the floor. Closer observation revealed many features associated with strike-slip movement on a crack, with a distinctive NW-SE compression direction. Observations (Kerinci earthquake) at the severely damaged Lempur Hilir Mosque that is built on thin Quaternary lacustrine alluvium revealed that the ground floor had a particular crack aligned N-S across the floor. Closer observation revealed many features associated with strike-slip movement on a crack, with a distinctive NW-SE compression direction. Both observational results suggest that the floors of the basketball field and the mosque were cracked due to body primary waves released by these earthquakes, and they are consistent with moment tensor solutions derived from instruments.