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ABSTRACTS

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S2.01

THE AFTERSHOCK SEQUENCE OF THE MARCH 26, 1993 PIRGOS (W. GREECE) EARTHQUAKE: RESULTS AND DISCUSSION.

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On the 26th of March 1993, 11:58 GMT an earthquake of magnitude Ms=5.1 (ISC), occurred near the city of Pirgos in NW Peloponnesus, causing considerable damage to the city and the surrounding villages. In order to study the aftershock sequence following this event a portable seismograph network of 8 3-component digital instruments was installed in the area, within the framework of a joint mission by the Athens and Thessaloniki Universities. During the two weeks that the network remained in operation more than a 1200 events were recorded. Data analysis, revealed that the events were located at depths of 3 to 30 km with magnitudes ranging from 1.5 to 4.0 R. The computed focal mechanisms for selected events indicated a variety of solutions, with nodal planes striking NNE-SSW, NE-SW, NNW-SSE and E-W.

Furthermore, in order to better define the seismic faults activated, the spatial and temporal evolution of this aftershock sequence was also examined using the principal parameters method. These results are presented and discussed in view of the transitional character of the tectonic regime in the area, situated between the external compressional and the internal extensional regime of the Hellenic Arc.

S2.02

THE NOVEMBER-DECEMBER 1994 LEFKAS (W. GREECE) EARTHQUAKE SEQUENCE: RESULTS FROM IN SITU SEISMOLOGICAL SURVEY

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On November 30 and December 1, 1994, two moderate earthquakes of Ms=5.2 and 5.0 took place in northwestern coast of Lefkas island (W. Greece), causing considerable damages in the nearby villages. The island is known to have suffered from 13 destructive earthquakes in the period 1612-1869, most of which are located at its northern part, while during the present century the most significant earthquake was the one of November 4, 1973, Ms=5.9. The aftershock sequence was recorded by a temporary seismic network comprising of six 3-component digital seismographs and one 16 bits digital strong motion recorder, installed on the island, for a period of three weeks following the main shocks. During that period more than 2000 aftershocks were recorded. The located epicenters are concentrated in a dense cluster on the meizoseismal area with depths between 0-12 km. The computed fault plane solutions indicate dextral strike-slip and oblique reverse slip on a NNE-SSW east dipping nodal plane, consistent with the direction of the observed co-seismic surface ruptures. The intensity distribution as well as in situ observations suggest that the macroseismic effects have followed the pattern of the 1973 event.

The precision of the locations due to the small epicentral distances and the high quality of the recorded waveforms allow the determination of the geometry and rupture process of the activated fault using different approaches like, doublets analysis, evolutionary power spectra, and synthetics. The results will be presented and discussed.

S2.03

AN UNUSUAL EARTHQUAKE TIME CLUSTER IN THE GREEK MAINLAND DURING MAY-JUNE 1995

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From 4 May to 15 June 1995, that is within only 43 days, four strong mainshocks occurred in the Greek mainland as follows: 4/5/95, M = 6.0 in Central Macedonia; 9/5/95, M = 5.2 in NW Macedonia; 13/5/95, M = 6.6 in SW Macedonia; 15/6/95, M = 6.0 in western Corinthos Gulf (M = surface-wave magnitude). From the instrumental catalog of the time interval 1911 - 1994 inclusive it results that the mean rates of mainshock occurrence equal to $\bar{r}$ 5.2 = 2.81481 x 0.001 events/day and $\bar{r}$ 6.0 = 8.51850 x 0.0001 events/day for $M \geq 5.2$ and $M \geq 6.0$, respectively. The observed rates within the above time interval of 43 days are r5.2 = 0.09302 events/day and r6.0 = 0.06977 events/day. Assuming that the Poisson model is an adequate description of the seismicity process in time in that area (e.g. Dionysiou & Papadopoulos, 1992), we find that the probability for observing four main events of $M \geq 5.2$, or three main events of $M \geq 6.0$, in the Greek mainland within 43 days equals to about 6.77 x 0.000001 and 7.53 x 0.000001 events/day, respectively. This implies that the May-June 1995 activity constitutes an exceptional earthquake time cluster. A seismicity triggering process may provide a plausible geophysical explanation. This predicts a non-linear stress build-up in a particular fault zone because of dynamic interaction with neighbouring seismic zones. Implications for successful short-term earthquake predictions are presented elsewhere.

Reference: Dionysiou & Papadopoulos: PEPI, 71, 154-165, 1992.

S2.04

THE KOZANI (GREECE) EARTHQUAKE OF MAY 13, 1995

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The Kozani earthquake (Ms=6.6) of May 13, 1995 is the strongest event of the decade in Greece and occurred in a region of low seismic activity. Using regional data and the strong motion record at the station of Kozani, we relocated the mainshock at 40.183° N and 21.660° E, beneath the Vourinos massif at a depth of 14.2 km. Using teleseismic broad-band records we computed a focal mechanism by body waveform modeling. The most likely fault plane strikes N240° and dips 40°N and the centroid depth is 11 km. Modeling of the strong motion record at Kozani confirms that nucleation started at the eastern termination of the bottom of the fault and propagated eastward.

Six days after the main shock, we installed a network of 40 portable seismological stations for a week around the epicentral region and recorded several thousands of aftershocks, among which we located 622 with a precision better than 1 km. Most of the 181 focal mechanisms show normal faulting consistent with the mainshock. The aftershock seismicity is restricted between 5 and 15 km depth and defines a plane dipping north at an angle of about 35°, consistent with the mainshock mechanism and likely related to the Deskati Fault. Seismic activity with the same pattern of normal fault mechanisms is also seen on an antithetic cluster connected to the main one at 12 km depth and which cuts the ground surface north of the Vourinos ophiolite massif in the valley of Siatista. These results indicate that the only observed surface ruptures of tectonic origin, located along the Paleohori fault, are probably secondary faulting connected at depth to the main Deskati fault.