AVERAGE REGIONAL SEISMIC STRAIN RELEASE RATES IN THE PATRAIKOS – SARONIKOS GULFS (CENTRAL GREECE) BASED ON HISTORICAL AND INSTRUMENTAL DATA

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The seismic moment release rate in the area bounded between the meridians 21.5°E-23.7°E and the parallels 37.7°N-38.5°N, covered by the Patraikos, Corinthiakos and Saronikos Gulfs, is determined. The main objective is the determination of the relation between the frequency of occurrence of earthquekes and the rete of deformation of a region with many faults. The last eerthquake in the Patraikos Gulf occurred in 1858 (M_S = 6.8) end the probability for the occurrence of a strong event in the next 20 years is very high.

The data used for the detarmination of the rate of deformation span a period of 240 years (1748-1985) and hava magnitudes with $M_S \geq 6.2$. This time period is considerably longer than the average return period of large earthquakes in this region (~ 35 years). The seismic moment release rate for the area was found equal to $0.48 * 10^{25}$ dyn cm yr^{-1}. Then, the strain rate was calculated which was found equal to $6.1 * 10^{-8}$ 45^{-1}. Wishing to examine the pattern of tha deformation in the area, we calculated the cartesian components of the moment tensor of seven earthquakes with reliable fault plane solutions. Thus, we found that the strain accumulation in the area is mainly taken up by north-south extension and vartical movements. These results are in agreement with the regional stress field.

EVIDENCE FOR A STOCHASTIC MODEL OF GLOBAL SEISMICITY

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The most reliable and complete data of earthquakes, with magnitudes $M \geq 7.0$, which occurred in the whole Earth, during a time span covering 90 years (1897-1986), have been used to test the hypothesis that the time difference of successive earthquakes follows a negative exponential distribution (Poisson process). The answer to the question whether or not the occurrence of earthquakes follows Poisson process, is very important for seismic hazard and earthquake prediction problems.

For this purpose the data set was separated in several samples by using a magnitude step equal to 0.1. Statistical techniques, like x^2-test and Kolmogorov-Smirnov test heve

been applied for samples with large and small ($n < 20$) number of events respectively.

An effort was made to distinguish foreshocks and aftershocks from the main shocks, as it was proved that x^2-test cannot be applied in clustering process.

The results showed that the large main shocks which occurred in various regions of the world, with magnitudes $M \geq 7.0$, follow a Poisson process. Concequently we can reach to the conclusion that the rate of seismic energy release remains almost constant, since the seismic energy is meinly released by the large earthquakes. This probebly indicates that the large shocks are independed events, while the smaller ones are affected by the occurrence of the large earthquakes.

SEISMIC ACTIVITY IN THE KASSANDRA GULF (NORTHERN GREECE)

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An attempt is made to study the seismic behaviour of the southern part of the Kassandra gulf (Chalkidiki peninsula).

Three seismic sequences with numerous and small earthquakes occurred in the area near Paliouri village, where a seismological station of the permanent telemetry network of the Geophysical Laboratory of the University of Thessaloniki is operated. The first one took place between 18 and 25 December, 1983. During this time period about 2380 small earthquakes were recorded by the Pallouri station (PAIG). The second one occurred four months later between April 30 and May 3 1984 at the same erea, and about 780 small earthquakes were recorded by the PAIG station. These two sequences were considered as swarms, since there were no earthquakes with magnitudes large enough to be considered as main shocks. The third sequence started on August 10, 1988. The main shock of this sequence had a magnitude of 4.5 and it wes preceeded and followed by foreshocks and aftershocks.

The space, magnitude and space-time distribution of these three sequences is studied in the present work. It is concluded that there must be two parallel faults in this part of the gulf with direction NNW-SSE. The seismic energy from these faults is released with numerous small earthquakes, although the potential of these faults is probably high enough to generate larger earthquakes.