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Spatio-temporal peculiarities of the crust structure in the seismic zone in Crimea

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122 earthquakes of energy classes $5 - 11.4$ occurred in the vicinity of the Crimea coast in the zone with coordinates $\varphi = 44.45 - 44.56°$N, $\lambda = 34.3 - 34.6°$E during three months of 1984. Study of travel times of P- and S-waves from these earthquakes recorded at the Crimea stations shows that travel time residuals calculated for a reference velocity-depth section are of opposite signs at Alushta and Yalta, and their values achieve ± 0.8 s from sources in the southern part of the region. Tomography inversion based on the Backus-Gilbert method extended to 3D case was applied to the travel time data. P- and S-wave velocities as well as the V_P/V_S ratio and the Poisson coefficient were mapped at the depths of 17, 19 and 21 km. Analysis of the maps shows that the southern part of the area is characterized by low both P and S wave velocities, whereas in the northern direction a high velocity body is revealed.However reduction of P-wave velocity in the southern part is much larger than that of S-wave velocity that results in anomalously low values of the V_P/V_S ratio $(1.6 \div 1.4)$ and the Poisson coefficient $(\sigma = 0.15 \div 0.5)$. The tomography images of the area under study at the depth of 19 km obtained in the other time intervals prior to (1975 – 1983) and after (1985 – 1990) the above-mentioned set of earthquakes in 1984 have no anomalies of the velocities, V_P/V_S ratio and σ, and the velocity values at the two maps are practically identical. Thus we may conclude that the anomalies of velocities, V_P/V_S and σ are characteristics of the medium and tectonic processes in the region of earthquake origination and may be regarded as a prognostic phenomenon.

On the coupling between global and regional seismicity and geomagnetic and solar activity

Gokov, A.M. (Kharkiv V. Karazin National University)

To test the consequences that the plate tectonic paradigm has, the possible association of global and regional seismicity with geomagnetic and solar activity has been studied by using the data obtained from the NEIS U.S. Geological Survey Earthquake Data Base at

http://neic.usgs.gov. The data for 1972 – 2005 with the M = 0–10 magnitudes are binned in M = 0–4, M = 0–5, M = 5–10, and M = 6 – 10 bins and the number of samples, N_Q, in each bin is determined for a few characteristic time intervals. To analyze the global and regional seismicity, the following seismic regions are chosen (in geographic coordinates): (1) $\lambda = 128° - 150°$E, $\varphi = 26° - 48°$N, (2) $\lambda = 95° - 195°$E, $\varphi = 10°$S–$10°$N, (3) $\lambda = 110° - 179°$E, $\varphi = 10° - 45°$S, (4) $\lambda = 24° - 76°$E, $\varphi = 23° - 42°$N.

To find the association between solar activity during two solar cycles and earthquake occurrence, the correlation between the radio flux at 10.7 cm and the monthly number N_Q is conducted.

To find the association between geomagnetic activity during the same two solar cycles and earthquake occurrence, the correlation between the monthly geomagnetic Ap index and the monthly number N_Q is conducted. In addition, the daily earthquake number distributions are calculated for the 2000 – 2004 and they are used for studying the correlation between the daily number N_Q and the daily geomagnetic Ap index.

To study the association between seismicity and geomagnetic activity, the planetary 3-hr Kp index and the number of earthquakes occurring in each 3-hr interval are analyzed during ten major earthquakes when $Ap = 100 - 180$ and $Kp = 6 - 9$.

The physical significance of the correlations that have been obtained is discussed.

◦ Small earthquakes of Northen Tien Shan and their depth distribution by KNET data

Green, T.P., Shukurov, U.S. (Research-methodical seismological expedition of Kyrgyz Institute of seismology, NAS, Bishkek)

American digital telemetry network KNET (Kyrgyz Network) operates on Northern Tien Shan from an autumn of 1991. This one consists of 10 seismic stations and 2 relays. Within its location the network allows to record without gap the weak earthquakes with $K \geqslant 6$ ($M \geqslant 1.1$) and also a lot of microearthquakes with K = 5 and 4. To determine with high accuracy the depths of all events taking place within network are not succeeded. However it is possible to determine with high accuracy (±2 km) the depths of earthquakes occurring di-