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Investigation of Q-factor of the North Tien Shan ground (Bishkek Geodynamic Test Site) on the basis of a code waves of local earthquakes

N. A. Sycheva[1]
I. V. Sychev[2]

[1]*Research Station of Russian Academy of Sciences in Bishkek city, Bishkek, Kyrgyzstan*
[2]*Trofimuk Institute of Petroleum Geology and Geophysics, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia*

Abstract

This work is devoted to estimation of absorbing properties (Q-factor) of the ground (crust and upper mantle) of Bishkek Geodynamic Test Site, which is based on code waves analysis for more than 5 000 local earthquakes which have happened on the explored territory during the period from 1999 to 2014. As a result of application of the author's program more than 150 000 records (Z, N, E components) were processed. The band passing filters with central frequency of 0.75, 1.5, 3.0, 6.0, 12.0 and 24.0 Hz have been used for filtering of initial seismographic records. A code waves have been considered in a window of various length: 5, 10, 20, 30, 40 and 50 s, in accordance with exploring depths of 65, 70 80, 90 and 109 km correspondingly. The frequency dependences of Q-factor in zones nearly KNET seismic stations (100 km radius) have been obtained first in the form. In the Q-functions received the Q_0 value is below 200 and the power exponent n is more than 0.7, both value are typical for tectonically active regions. With an increase in exploring depth the Q_0 value increases, and this indicates the changes in the ground properties. The $Q_c(f)$ functions obtained are used in computation of seismic waves attenuation function, which is involved to reconstruction of focal spectrum to determine dynamic parameters of earthquakes.

Keywords

Seismic station, Earthquake, Code wave, Attenuation function, Q-factor, Damping coefficient

References

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