



**DYNAMIC CHARACTERISTICS OF BACKGROUND SEISMIC NOISE
ACCORDING TO RECORDS OF NUCLEAR MONITORING
SEISMIC STATIONS IN KAZAKHSTAN**

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**ДИНАМИЧЕСКИЕ ХАРАКТЕРИСТИКИ СЕЙСМИЧЕСКОГО ШУМА
ПО КАЗАХСТАНСКОЙ СЕТИ СТАНЦИЙ ЯДЕРНОГО МОНИТОРИНГА**

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An effectiveness of seismological stations for detection and identification of underground nuclear explosions is determined, to a great degree, by dynamical characteristics of background seismic noise. The background seismic noise originates because of influence of various natural and industrial phenomena.

The seismic stations of Kazakhstan, included into nuclear monitoring network (fig. 1) are equipped with broadband seismometers; seismic data are recorded in digital format. All this allows to investigate spectral and time characteristics of seismic background noise in very large frequency diapason (more then 3 - 5 orders), for all three components of oscillation vector.

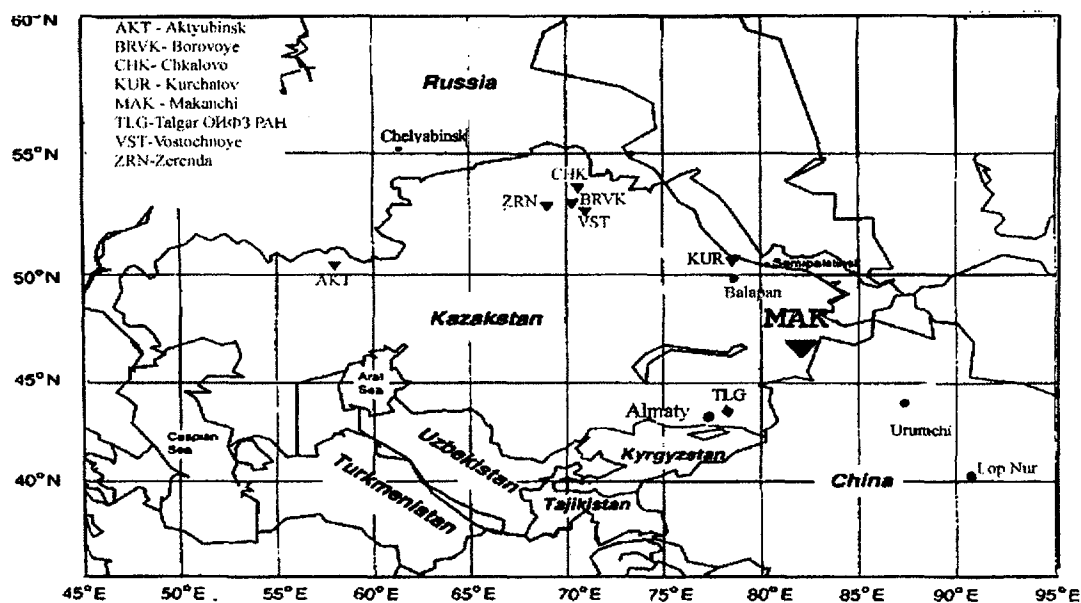


Fig. 1. The location of seismic station of IGR NNC RK.

The spectral density of background seismic noise for vertical and both of horizontal components (fig. 2) was calculated for all of the observation points. The regular features of structure of noise spectra, inherent for all of the studied observation points, as well as some features, specific for studied places were found. The curves of spectral noise density were compared with global noise model, determined by the data of Global Seismological Network (GSN).

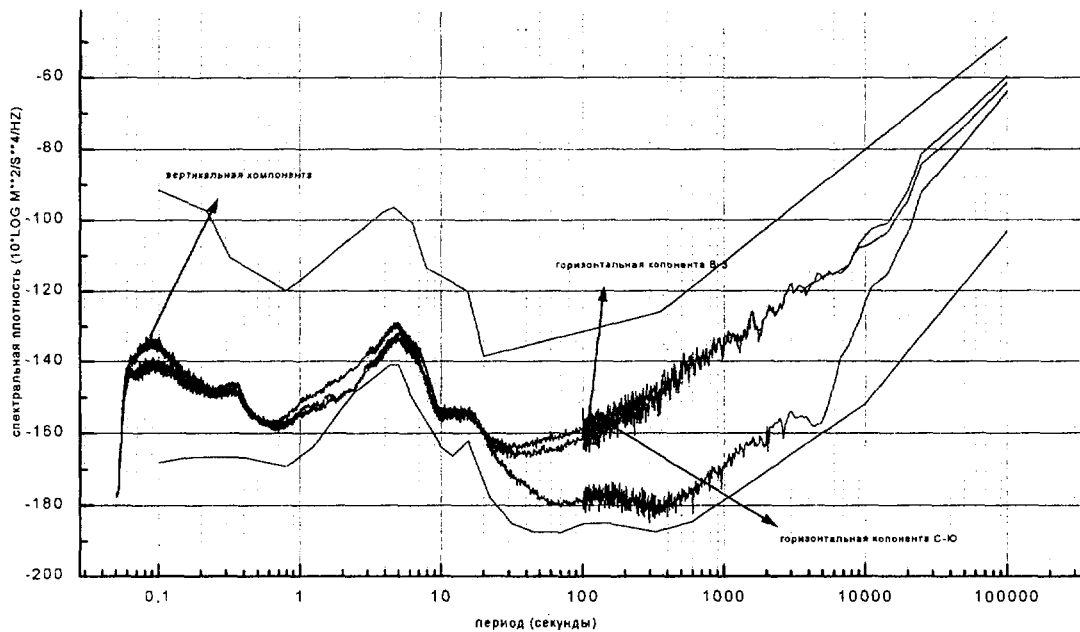


Fig. 2. Spectral density of seismic background noise of three components of seismic station in Makanchi.

The variability of spectra of seismic noise for long time diapason was studied. The existence of diurnal and seasonal variations of the background noise level was found. The 80-% percentiles, describing the spread in values for each frequency were estimated. In common, the variations are less then 10% of noise level.

For high-frequency band (>1 Hz) there exist apparent dependence between noise level and location of observational point. The difference in noise level for Kazakhstan station for this region reaches up to 20 dB. The observatory Borovoye and stations, belonging to Borovoye large-aperture array are the «quietest» stations. Because of such favorable location these stations are included into IRIS network and into nuclear monitoring network. The Aktiubinsk and Talgar stations are the «noisiest» ones. There is almost no difference in noise level for all stations for periods 5 - 20 seconds; the spread of noise levels lies within accuracy of determination.

Noise level for long-period band differs from station to station, but these differences are not connected with station locations.

Results of performed analysis will allow taking into account the features of background seismic noise while solving various tasks of analysis of digital seismological data.

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