SEISMIC ARRAYS «OZHEREL'E» OF GEOPHYSICAL OBSERVATORY «BOROVOE»

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Susbsystem "Ozherelye" of peripheral points Zerenda, Vostochniy, Chkalovo of the large-base seismic array of Geophysical Observatory "Borovoye" has been studied. At the example of recording of underground nuclear explosions carried out at Nevada Test Site, local travel time curves and linear trends of the P wave travel time at the traces: "Pahute test site – peripheral points Zerenda, Vostochniy, Chkalovo" have been investigated.

The Borovoe system (BRVK) is a «triangle» type system (in Figure 1), consisting of four points: Borovoe - central, Zerenda (ZER), Vostochniy (VOS), Chkalovo (CHK) - at the tops of the triangle (Table 1). Around each of the peripheral points is located on six points with one-component seismometers (called "OZHEREL'E"). "OZHEREL'E" from Russian means necklace. The diameter of the subgroups "OZHEREL'E" is 6 km. The total aperture size of the system is 135 km. The greatest diurnal variations were noted at the stations of the Borovoe group. All of them are concentrated in the frequency band above 1 Hz and reach the vertical part at an extreme 10 dB at the Borovoe station. At stations Zerenda, Vostochniy, Chkalovo, the difference is not higher than 5 dB. Table 1 shows the coordinates of the vertices of the triangle and "OZHEREL'Es".

Interest in Borovoe station especially increased after receiving unusually strong records of "useful" signals from the so-called "7th district" (Nevada Test Site in USA (NTS)). In this section, variants and local travel times for the subsystem Zerenda (ZER), Vostochniy (VOS), Chkalovo (CHK) of the larger base system of the seismic arrays (BSG) 6 to 10 kT) will be considered and local travel curves produced at a distance of 10,000 km and registered by the Borovoe (BRVK). In full, the system "OZHEREL'E" began operating in June 1979. The application of the optimal methods of frequency, polarization and space-time filtration to the registration materials of a larger base grouping system ensuring reliable detection and determination of the main parameters of explosions at the Nevada range at a power level of 1-5 kT. The development of research in Borovoe GO in these years is reflected in publications (Adushkin, An, 1990, Richards, Kim, Ekström, 1992).

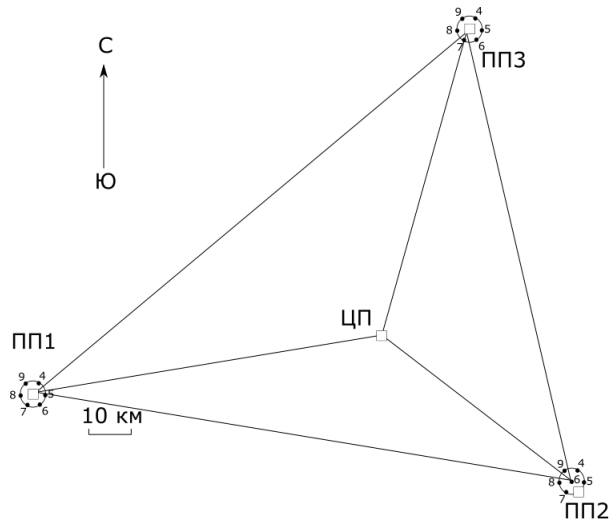

Fig.1. Geophysical Observatory “Borovoye” plan with susbsystem “Ozherelye” of peripheral points Zerenda, Vostochniy, Chkalovo) [Adushkin, An, Ovtchinnikov, 2000]

Point	№ Uncontrolled point	latitude (°N)	longitude (°E)	Altitude (m)
Zerenda ZER	**ППП1**	**52.9506**	**69.0056**	**384**
	4	52.9704	69.0323	358
	5	52.9461	69.0485	380
	6	52.9271	69.0338	386
	7	52.9294	68.9772	306
	8	52.9546	68.9633	292
	9	52.9771	69.0027	300
Vostochniy VOS	**ППП2**	**52.7231**	**70.9805**	**297**
	4	52.7686	70.9906	266
	5	52.7435	71.0042	261
	6	52.7478	70.9649	272
	7	52.7276	70.9370	282
	8	52.7524	70.9211	285
	9	52.7696	70.9511	293
Chkalovo CHK	**ППП3**	**53.6756**	**70.6162**	**124**
	4	53.6952	70.6431	96
	5	53.6716	70.6592	120
	6	53.6509	70.6324	133
	7	53.6539	70.5869	113
	8	53.6796	70.5731	59
	9	53.6975	70.6002	90
Borovoye BRVK	**ЦП**	**53.0581**	**70.2828**	**315**