

Geophysical effects of high altitude nuclear tests in 1962

Lyakhov A.

Institute of geospheres dynamics of Russian academy of science, Moscow, Russia

e-mail: alyakhov@idg.chph.ras.ru

In 1962 USA and USSR have evaluated nine high altitude nuclear test (HANE) in the ionosphere. The altitude range was from 50 to 450 km and the yield varied from 2.8×10^{13} to 6×10^{15} J. Up to date the physics of the HANE event seems to be well known [1,2] as well as our understanding of the ionospheric processes. From the geophysical point of view the test in 1962 can be considered as active experiments with the known source parameters.

However, the intriguing prompt effect has been observed, namely the global disturbance of the lower ionosphere. It was observed via the monitoring of VLF-LF transmitters in USA and in Western Europe. The frequency range was 16 - 110 kHz, the path length varied from 5000 to 200 km and unique multipoint simultaneous observations on the propagation path were available. The evidence is that the prompt jerk in the amplitude was observed within the first second after the detonation at the distances up to 9000 km. Such distance excludes the possibility to view the zero point from the lower ionosphere on the propagation path. The archive data are presented and the theoretical qualitative explanations given in 60-s are discussed. The inconsistency of the proposed theoretical models with US and European data is shown.

1. Zamyshlyayev B.V. et al. The physics of nuclear explosion. Moscow. Nauka. Physmatlit. 1997.
2. Knapp W.S. Handbook. DNA-3499H, 1975. AD-A010-228. 199P