

Features of Nuclear Explosion and Earthquake Waveforms from the Lop Nor Test Site Area Using Digitized Analog Seismograms of Kyrgyzstan

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The National Data Center of Kyrgyzstan and Michigan State University (MSU) are digitizing historical analog seismograms of nuclear explosions that were conducted at the People's Republic of China (PRC) Lop Nor test site. The methodology for digitizing and data quality control was developed by the MSU team. Of significant importance is the recovery of original station calibrations and amplitude-frequency response enabling the generation of dataless files. This allows data display in units of ground motion and the ability to conduct modern digital processing on the waveforms.

In total, 245 3-component seismograms of 26 atmospheric and underground nuclear explosions were digitized for the period 1966-1996, recorded by 35 stations at epicentral distances of 754-1542 km. For most digitized seismograms we are reliably able to recover data up to 5 Hz.

Based on the records of seismic stations of the Kyrgyz system of seismic monitoring, a comparative analysis of the wave pattern of underground nuclear explosions carried out at the Lop Nor test site and tectonic earthquakes that occurred in the same area was carried out. The spectral ratios of the amplitudes of P- and S-waves (e.g., Sn/Pn and Lg/Pg) were measured to search for effective criteria for seismic discrimination of underground nuclear explosions and earthquakes.

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Promotional text

Most testing at Lop Nor occurred during the analog recording era, thus recovery of the regional analog data from testing at Lop Nor is of critical importance. This data can be used for different CTBT-related purposes.

Oral preference format

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