

EERI Special Earthquake Report

Kyrgyzstan Earthquake of August 19, 1992

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On August 19, 1992, at 02:04 hrs GMT (08:04 hrs local time) a strong earthquake occurred in the territory of Kyrgyzstan. The Institute of Seismology of the Academy of Sciences of the Republic of Kyrgyzstan organized three groups (seismological, geological, tectonophysical) for macroseismic study of the consequences of the earthquake and two groups for laboratory data processing as well as two groups for magnetometric and seismometric observations in the zone closest to the strongest motions. Most of the affected territory is located in a mountainous area where access is difficult.

Coordinates of the epicenter of this earthquake, determined by the data registered by seismic stations of Kyrgyzstan are 42.04 N, 73.38 E. The depth of the focus is 25 km. According to the dimensions of the focus and emitted energy, this earthquake is the largest in the Tien-Shan region since the Chat-Kal earthquake of 1946.

The main shock of the August 19, 1992 earthquake was felt by the people in the whole territory of Kyrgyzstan. Shocks were felt over a vast territory including the regions of Uzbekistan, Tajikistan and Kazakhstan. The shocks were felt even in Karaganda and Pavlodar. The zone of maximum motions embraced the southern and especially northern part of the Suusamyр ridge, Suusamyр and Aramsuisky, and part of Toktogul and Talas valleys. The earthquake

manifested itself with the utmost force (magnitude 9 and more) on the mountain pass Muztor, and with magnitude 8 and more felt in the remote settlements of Toluk, Sarysogot, and Soviet. (*Editor's note: the term magnitude as used by the authors apparently refers to the intensity of the ground shaking.*) The characteristic peculiarity of isoseismals of this earthquake is the small area of the strongest destruction and the significant dimensions of the area of perception.

The first evidence of the earthquake, as reported by persons in the epicentral area, was strong underground noise, described as a "drone". During the shaking, the noise emanating from the ground was so strong that it was not possible to hear the noise of falling household goods, chimneys, ovens, walls and roofs. People who were sitting on the floor were thrown up by the motions and people who were standing could not keep on their feet. Horses cowered on their hind legs and could not stand. Observers reported that "waves" ran across the land.

In the epicentral zone, cracks appeared on the surface, and in the mountains, mass collapses and landslides took place. Rock outbursts were observed, causing holes in the land surface of 0.5 m diameter, accompanied by water spouting up to 15 m high. Collapses and landslides also occurred in the river flood plain terraces, and were especially significant along the narrow part of the valley of the Suusamyр river.

The region of maximum motions (8-9) is 35-40 km long, with an

average width of 15-20 km. In this region there were no settlements, except for a few buildings, located along the Bishkek-Osh road, which were totally ruined. On the basis of observations and information obtained from the local inhabitants, it is possible to conclude that the primary direction of the motion was almost vertical in character. This is proved by the character of destruction of buildings and direction of dipping, moving and turning of objects during the earthquake.

The focus of the main shock, according to the data of seismic stations of the region, is characterized by a meridional near-horizontal compression and near-vertical tension. Such a strained state was the background of the upthrust deformation.

The earthquake was characterized by very strong aftershock activity. As of September 10, 1992, 473 aftershocks were registered, 138 of which were in the energetic class of over 10. Fifteen of them were felt, even in the city of Bishkek, with the strength of motion from 4 to 6. The highest aftershock activity fell on the first five days, from August 19 to 23, during which time 372 aftershocks took place, about 55% of the total quantity registered as of September 10, 1992. From August 24 to 27 the number of strong aftershocks dropped sharply, though the number of weaker ones remained at the average level of from 32 to 12 a day. From August 27 to September 10, 1992 the aftershock activity considerably decreased. Three to five aftershocks a day were registered; one, or rarely two, had energetic class equal to or exceeding 10. Aftershocks occurring from September 6 to 9, 1992 with energetic class above 10 were not observed.