Large earthquake on January 22, 2024 with Mw=7.0 in the south of Tien Shan

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Abstract The first results of the analysis of instrumental and macroseismic data of the large earthquake, occurred in January 22, 2024 in the area of the Gissar-Kokshaal fault of the Tien Shan, are presented in the paper. The reverse-thrust type of focal mechanisms is dominated in the obtained fault plane solutions of the main shock and the strongest aftershocks. The strike of nodal planes along the fault has been identified, which is coordinated with the northeastern orientation of the aftershock cloud and, in general, with the geodynamic situation of the junction zone of the Tien Shan and the Tarim Basin. The dynamics of the rupture in the source was complex, several sub-events with different energies were presumably identified. This was reflected in the discrepancy between the parameters of the hypocenters, especially depth, in the solutions of different seismological centers. The dependence of the intensity in points on the distance for this earthquake was received. An analysis of records from strong motion instruments based on data from corresponding stations in Central Asia showed that the highest amplitudes of PGA accelerations equal to 30–43 cm/s^2 correspond to an intensity of 6 points and were registered for distance from 88 to 182 km from the epicenter.

Keywords Large earthquake, Tien Shan, focal mechanism, aftershocks, strong motions, intensity.

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