Means of synchronization of independent seismic stations in seismic arrays

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Abstract. Basic reasons for different kinds of failures of records synchronization of the independent seismic stations operating as elements both of domestic and foreign seismic arrays are established. Proceeding from it are proposed soft and hardware for ensuring reliable and exact synchronization of stations. Their operation is based on periodic fine tuning of station's ADC sampling cycle by a exact time signal obtained from the GPS receiver. This procedure is executed with minimum additional load on the controller of the seismic recorder or without it at all. Such approach allows not only to find accordance of each ADC sample to astronomical time, but also to provide simultaneous ADC sampling of all stations in seismic array to within 10 us that is especially important for solving of a row of geophysical problems.

Experimental researches and trial operation of the created equipment are carried out. They confirmed its high reliability and compliance of technical characteristics to purposes of the development.

Keywords: small aperture seismic array, synchronization of seismic recordings, independent seismic station, receiver GPS, microcontroller.