

Improving Detection Quality of Primary IMS Seismic Stations

Monitoring of underground nuclear tests is based on the Primary Seismic Network of the International Monitoring System (IMS) consisting of 3-C stations and arrays. Detection of signals is the principal task of stations. The capability of finding an event of interest depends on station sensitivity, i.e. detection threshold and reliability of signal attributes such as arrival time, signal-to-noise ratio, amplitude, period, and so on. The current set of parameters used by the International Data Centre for station processing yields a detection list of good quality. There are several problems, however, that call for further improvement. These include, inter alia, a high rate of phases wrongly associated with event hypotheses during automatic processing, a large fraction of manually added arrivals (more than 10%), arrivals renamed from noise (N-) phases (up to 10%) in the Reviewed Event Bulletin, and re-timing of many arrivals by more than 4 s. To investigate the reasons for these and other problems and to find appropriate solutions, the IDC develops a tool for off-line data re-processing and analysis. We present its methods of analysis and parameter optimization.

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