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T3.3-O8. Toward High-Confident and Full Automation of Seismic Data Processing for CTBT Monitoring

Seismic monitoring activities, either for CTBT or earthquake-induced disaster control, are facing a new era of big data as the number of seismic stations, has increased rapidly and significantly. However, the reality that up to date routine seismic data processing is still heavily relied on manual interactive analyses can hardly fit situations of the new era.Aim to develop technologies for full automation of seismic monitoring; we have carried on a series of researches in recent years to explore novel techniques for high-confident seismic data processing. The researches involve techniques to characterize and use seismograms' integral features for seismic phase identification and association; techniques to reliably associate teleseismic signals recorded at regional seismic networks; system techniques of CASM (Computer Analyst for Seismic Monitoring) whose objective is to take the task of human being analysts for seismic event review; and techniques to automatically identify seismic events by knowledge-match including envelope or waveform cross-correlation. Some of the new techniques have been applied or tested for regional seismic networks with satisfying results. A brief review about these techniques with discussions about their prospect to be applied to global seismic network will be present in this report.

Primary author: JIN, Ping (Northwest Institute of Nuclear Technology)

Presenter: JIN, Ping (Northwest Institute of Nuclear Technology)

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