[JJ] Evening Poster | S (Solid Earth Sciences) | S-TT Technology & Techniques

[S-TT50]seismic monitoring and processing system

convener:Masayuki Yoshimi(Geological Survey of Japan, AIST)
Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
This session covers scientific and technical issues in seismic monitoring or data processing systems for earthquakes or explosions observation. This includes, development or improvement of seismic observation networks, innovative techniques in observation and monitoring, cutting edge data acquisition and processing techniques in geophysical explorations. Other topics related to geophysical observation are also welcome.

[STT50-P06]The progress on the waveform data quality control of IGP DMC, China National Seismological Network

*Xiufen Zheng[1], Leiyu Mu[1], Fang Wang[1], Jun Wang[2] (1.Institute of Geophysics, China Earthquake Adminstration, 2.Earthquake Administration of Jiangsu Province)
Keywords:waveform data qulity control, Data Management Center (DMC) at IGP, CEA

China Earthquake Administration (CEA) has gradually upgraded and expanded its national and regional digital seismic networks since the late 1990s. Completed in early 2007, the China National Seismological Network (CNSN) is now the largest permanent seismic network in the world, consisting of a backbone national seismograph network, 31 regional networks, and several small aperture arrays with almost 1200 stations. Station spacing varies drastically with location and reaches to 20~100 km in the eastern and central parts of China (Figure 1). While CNSN is anticipated to play an important role in monitoring seismic activities, mapping rupture details of large earthquakes, providing early warning, seismic risk assessment and mitigation in China, it also opens a new window to directly “view” details of Earth’s interior to an unprecedented level and shed lights to fundamental processes that have shaped and are shaping the Earth.

The DMC at Institute of Geophysics (IGP), CEA was established at the end of 2007. IGP DMC now receives and archives waveform data in real-time. The technical system of IGP DMC is designed to carry out data management, processing and service. We developed and integrated a hardware system with high-performance servers, large-capacity disc arrays for on-line data, NAS for near-line backup data and other facilities, as well as software packages for real-time waveform data receiving, storage, quality control, processing and service. In nearly 10 years, The DMC has supplied about PBytes-level waveform data to over 500 researches of more than 85 academic institutions. According to incomplete statistics, over 300 papers have been published in professional journals, in which 200 were indexed by SCI.

For the purpose of promoting the ability and level of seismic station operation and maintenance, ensuring waveform data and metadata quality, at the end of 2016, IGP DMC played a leading role in the work of research and technical system construction on the waveform data quality control. Mainly based on the MUSTANG of IRIS DMC, we focus on the abnormal information detection related with network communication, instrument (seismometer or datalogger) and power supply, et al., abnormal information push to the station operation staff, statistical reports and ranking charts to the administrative department. By means of cloud computing and artificial intelligence, the system is expected to be a modular, automatic, on-line system in near real time. The data and metric access is performed via web services with multivariate form and the superior visuality. Up to now, the initial construction has been

almost completed, including index of max gap, max overlap, num gaps, num overlaps, num spikes, orientation check, PDF and rms of PSD.