
 [JJ] Evening Poster | S (Solid Earth Sciences) | S-CG Complex & General

[S-CG65]Reducing risks from earthquakes, tsunamis &volcanoes: new applications of realtime geophysical data

convener:Mitsuyuki Hoshiba(Meteorological Research Institute), Satoshi Kawamoto(Geospatial Information Authority of Japan), Naotaka YAMAMOTO CHIKASADA(防災科学技術研究所, 共同), Masashi Ogiso(Meteorological Research Institute, Japan Meteorological Agency)

Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

As the number of population centers grows in regions with earthquake, tsunami and volcano hazards, the importance of improving methods for rapid, realtime estimates of activity increases. Realtime monitoring, analysis, and prediction of seismic ground motion, crustal movement and tsunami will be powerful tools to contribute to earthquake and tsunami disaster preparedness/mitigation. Tsunami and Earthquake Early Warning systems exist today in many locations around the world. Now JMA has started to promptly provide Eruption Notices to inform people of impending and beginning volcanic eruptions. Large events like the 2011 Tohoku Earthquake (Mw9.0) have demonstrated some of the shortcomings of existing techniques. In this session, we invite presentations on new ideas, methods and applications of (near) realtime analysis of seismic, geodetic and tsunami data, to the problem of realtime prediction aimed at improving disaster preparedness/mitigation in the fields of earthquake, tsunami and volcano observation. Presentations are encouraged to bring together scientists, engineers, and practitioners from a broad range of backgrounds from around the world, and to promote collaborative communication at the leading edge of the science and technologies.

[SCG65-P05]Hypocenter determination around the 2011 off the Pacific coast of Tohoku Earthquake by automatic processing using PF method

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Keywords:automatic hypocenter determination, the 2011 off the Pacific coast of Tohoku Earthquake

The 2011 off the Pacific coast of Tohoku Earthquake caused extremely active seismicity over a wide area. In this situation, because all the detectable earthquakes could not be completely scrutinized, the Japan Meteorological Agency (JMA) set the higher threshold of the magnitude for registering with the JMA unified catalog. In the Tohoku case, JMA used $M \geq 3$ in offshore and $M \geq 2$ in inland of the aftershock area as the threshold. However, the automatic hypocenter determination system using Bayesian estimation (PF method; Tamaribuchi et al., 2016) was developed to determine hypocenters in the wide aftershock area, and JMA has started to operate this method since April 2016. For example, this method could determine over 70,000 hypocenters in range of two months for the 2016 Kumamoto Earthquake. In this study, we applied this method to the continuous seismic waveform data in March 2011 with the petabyte-scale large continuous seismic data analyzing system (Nakagawa et al., 2016) of the Earthquake Research Institute. As a result, this method determined 122,353 events more than twice as much as the JMA unified catalog (55,273 events) in March 2011. Comparing our results with the JMA unified catalog, a large number of missing events was found and the detection rate is approximately 90% for $M \geq 1$ events at the shallow inland area (Depth ≤ 30 km). The PF method is effective for monitoring spatio-temporal aftershock activity even in the wide aftershock area such as the Nankai Trough earthquake. We also report the detailed features of seismic activities revealed by newly detected

events.