

Processing Situation after improvement of JMA's earthquake catalog

*Satoshi Takahama¹, Nobuyuki Hirota¹, Naoyuki Yamada¹, Noriko Kamaya¹, Tetsuo Hashimoto¹

1. Japan Meteorological Agency

Based on the policy of the Headquarters for Earthquake Research Promotion, Japan Meteorological Agency (JMA) collects the data of the high-sensitive seismographs nationwide, performs the processing of hypocenter determination centrally, and publishes the result as the earthquake catalog.

The earthquake catalog has been improved by JMA on April 1, 2016 (Japan Standard Time). The main improvement was application of PF method (Tamaribuchi, 2016) which was an automatic hypocenter determination technique, and raising detection capability and efficiency of the hypocenter determination processes.

Specifically, main improvements are as follows. Threshold of magnitude (Mth) for making a scrutinized analysis (picking P and S arrivals and maximum amplitudes at many stations) by analysts is set for each area and depth of the hypocenter. An earthquake which magnitude is equal or bigger than the Mth, the scrutinized analysis is made as same as before. If the magnitude is smaller than the Mth, parameters determined by the PF method are basically adopted and registered to the earthquake catalog. For detected earthquakes which locations have not been calculated by the PF method, analysts make simple analysis. Simple analysis means picking P and S arrivals and maximum amplitudes by analysts at most 10 stations. For shallow earthquakes occurred in inland, the Mth is M2. The Mth for earthquake occurred in sea area depends how far from the observation network in inland. The Mth is gradually raised as the distance from land, and the biggest Mth is M4.

As the PF method has been introduced to the JMA's procedure to make earthquake catalog, new flags which indicates the differences in analysis methods and the accuracy of the hypocenter have been added. JMA started to introduce these new procedures to make earthquake catalog on April 1, 2016. Total number of the hypocenters in the catalog has approximately doubled, and hypocenters which parameters are automatically calculated occupy approximately 60% of the catalog. For the Kumamoto earthquake and other big earthquakes occurred after April in 2016, by utilizing automatically determined hypocenters, JMA could successfully enhance documents for press release and contribute evaluation of seismic activity by the Earthquake Research Committee.

We would like to introduce processing situation of this new earthquake catalog including processing situation of the sequence of the 2016 Kumamoto Earthquake.

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