Category and Session number: NH2

Preferred Mode of Presentation: Poster

The environments for the routine analysis of moment tensor solutions in BMG, Indonesia

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The Indonesian archipelago is one of the most active regions with seismicity in the world, and the analyses of hypocenters and source mechanisms of earthquakes are very important for monitoring the tectonic activity and the disaster mitigation. Meteorological and Geophysical Agency of Indonesia (BMG) is responsible for monitoring the earthquake activities for the disaster mitigation programs using the data from the seismic networks.

BMG and Japanese scientific institutions have conducted a collaboration work on broad-band seismic observations in Indonesia. We installed 23 broad-band seismographs which is covering almost of the Indonesian islands. Recently, the network that so called JISNET (Japan-Indonesian Seismic NETwork), is operated by BMG and National Research Institute for Earth Science and Disaster Prevention (NIED), Japan. In spite of its original scientific purpose, the JISNET data were used to elucidate the fate of the subducted oceanic plate in the mantle, now the data are also being used for practical purposes, such as for the disaster mitigation programs.

We developed the application package for analyzing focal mechanism of earthquake by using JISNET data[1]. Due to the sparse interval for each seismic station, it is difficult to obtain focal mechanism using polarization data of P-onset. So we modified the Moment Tensor Analysis method[2]; the program can solve Moment Tensor using small number of stations, even single station data. This application can be operated under UNIX and Windows and the operation is easy. By using this application we can obtain hypocenter and focal mechanism solution for a certain event a few tens of minutes just after the occurrence. Now we are making the catalog of the Moment Tensor Solution of earthquakes occurred around Indonesia, using JISNET data and the application. We expect to be able to explain the dynamic of the Indonesian tectonics by the catalogue much better.

References

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