



FDSN Web Services integrated with Automatic Moment Tensor calculation

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Moment Tensors (MT) are used in a wide range of seismological research fields, such as stress inversion, shakemap generation, tsunami warnings, and many other studies, constituting the automatic and quick determination an important task. The Fortran software calMwandFM provides the ability for a near real-time automatic MT computation by applying the FMNEAR and MWNEAR calculation approaches (Delouis et al., 2009 and 2014). Meanwhile, the Federation of Digital Broad-Band Seismograph Networks (FDSN) (Ahern, 2003), developer of the Standard for the Exchange of Earthquake Data (SEED), has additionally produced a utility for homogeneous seismological data distribution; the FDSN Web Services (FDSNWS). These web services unfold exchange of time series data (FDSNWS-dataselect), related metadata (FDSNWS-station) and seismic event information (FDSNWS-event). More and more institutes and data centers are supporting the FDSNWS either for external or internal use. This can also be acknowledged since it became a seismological data distribution standard for the European Integrated Data Archive (EIDA). Thus, the same client software that supports the FDSNWS interconnection could be attached to and work with any data center that runs these Web Services. The Python library ObsPy (Beyreuther et al., 2010), which facilitates the development of seismological software packages and workflows, supports the FDSNWS interconnection via its Python API. This feature offers the ability to determine a way of integrating the FDSNWS to an existing near real-time seismological application, like the automatic MT computation by Delouis, 2014. In this work, we developed a program, written in Python, that supplies the data center with the ability to check for new seismic events in near real-time served by the FDSNWS and to trigger the automatic MT process based on specified configurable thresholds. The triggered procedure includes the request of waveform and stations' metadata through these Web Services, data manipulation for the related automatic MT application and results' preparation and distribution. The program could be attached to any data center that operates a Linux OS and runs both the FDSNWS and the automatic MT computation by Delouis, 2014. Finally, since the source code is open and free to the scientific community, it could be easily modified in order to support other similar near real-time purposes.

References

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