

**IASPEI WG in CoSOI commission:
Automatic and routine Moment tensors: benchmark and verification platform**

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Status Quo:

Routine and automatic moment tensor analysis is more and more developing and used by several agencies, Universities and surveys. Systematic global and regional moment tensor services are becoming a standard in many countries, and different catalogs are provided for the community. Software toolboxes offer standard moment tensor tools – but results depend very much on the data pre-processing, data selection and implemented methodologies. Often, quality criteria for the processing and method implementation are not easily available or not provided. Systematic comparison between moment tensor routines are not easily possible, and comparison of catalogs indicate systematic differences (e.g. already in seismic moment or moment magnitude).

Next steps of development, e.g. towards automatic and routine kinematic solutions, have started.

Aim of the working group:

The main aim of the working group (WG) on routine moment tensor solutions is to develop and implement a benchmark and verification platform for moment tensor procedures, and to publish recommendations for the scientific community on how to use the testing structure.

The idea is that new (routine) methods and young researchers new to the field can find and use the benchmark and verification platform to test their developments over a broad range of applications.

This should lead to better comparable moment tensor results (e.g. at local, regional, teleseismic distances) for the community.

The concept how to design and how to reach the aims will be discussed within the group. For discussion, we suggest to develop a database of ground truth events representative of a broad type of seismicity and monitoring conditions, and including synthetic datasets (e.g. Green function databases), so that users can verify their codes with individual events, but also their processing approach by creating their own dataset adapted to the geometry / frequency range / event types they would like to analyze.

The database may be accessed via a platform with implemented “generator tool” (seedlink server). A toolbox for automatic comparing own results to results from others may be provided. We suggest that the system does not actively compare different methods, but only provides standardized comparison reports as feedback. The reports may be used as reference by the services.