

Reply to Piero Poli's comments (RC1) on “obsSpyDMT: A Python Toolbox for Retrieving and Processing of Large Seismological Datasets”

1) Table 2: for the comment `--event_catalog` the default is `LOCAL`. What is a `LOCAL` catalog? It is a catalog the user has in the local directory? I guess this can be explained a little better.

REPLY: Clarified as follows (Table 2):

OLD:

Event catalog, currently supports `LOCAL`, `NEIC_USGS`, `GCMT_COMBO`, `IRIS`, `NCEDC`, `USGS`, `INGV`, `ISC` (default: `LOCAL`).

NEW:

Event catalog, currently supports `LOCAL`, `NEIC_USGS`, `GCMT_COMBO`, `IRIS`, `NCEDC`, `USGS`, `INGV`, `ISC` (default: `LOCAL`).

"`--event_catalog LOCAL`" searches for an existing event catalog on the user's local machine, in the `EVENTS-INFO` subdirectory of `--datapath <PATH>`. This is usually a previously retrieved catalog.

2) I would like to see a better explanation of the outputs, in particular how the catalog is stored. The catalogs contain invaluable information for seismologists. The catalog is stored in the `EVENTS-INFO` directory in 3 formats, which should be explained and showed probably in the appendix.

REPLY: Clarified as follows in the caption of Figure A1:

OLD:

For each request, obsSpyDMT creates the depicted directory tree inside the user-specified directory `datapath/`, and arranges the retrieved data either in different event directories (for event-based requests) or in chronologically named directories (for continuous requests). It also creates a directory in which a catalog of all requested events/time spans is stored. Raw waveforms, StationXML/response files and corrected waveforms are collected in subdirectories. While retrieving the data, obsSpyDMT creates metadata files such as station/event location files, stored in the `info/` directory of each event.

NEW:

For each request, obsSpyDMT creates the depicted directory tree inside the user-specified directory `datapath/`, and arranges the retrieved data either in event subdirectories (for event-based requests) or in chronologically named subdirectories (for continuous requests). It also creates a subdirectory `EVENTS-INFO/` in which a catalog of all requested events or time spans is stored. **Earthquake metadata (datetime, latitude, longitude, depth, magnitude, moment tensor, source time function) is stored in CSV and QuakeML formats (files `catalog.txt`, `catalog.ml`). File `catalog_table.txt`**

organizes basic event information (latitude, longitude, depth, datetime, magnitude) in a table. Raw waveforms, StationXML/response files and corrected waveforms are collected in subdirectories. During the data retrieval process, obspyDMT also creates metadata log files about retrieved station and event files, stored in the info/ subdirectory of each event directory.

3) *A good way to store the catalog, could be to have a simple csv file in which lat lon dep time mag mag type contributors and event id are stored. This simple file can be used by users who prefer to process the data outside python environment, and benefit from a user friendly and cross platform format.*

REPLY: This option existed and has been emphasized in the revised text (see previous comment).

4) *I would like to know better how DMT communicate with ISC. In fact, ISC provide two catalogs: the reviewed one (with a ~2years latency) and the normal bulletin containing all the events from different agencies. I suggest that while using the ISC option the user can choose in between the two available catalogs.*

REPLY: An option flag to specify the ISC bulletin has been added to obspyDMT, and Table 2 has been updated accordingly:

OLD: -

NEW:

--isc_catalog <COMPREHENSIVE/REVIEWED>

Search either the COMPREHENSIVE or the REVIEWED bulletin of the International Seismological Centre (ISC).

COMPREHENSIVE: all events collected by the ISC, including most recent events that are awaiting review.

REVIEWED: includes only events that have been relocated by ISC analysts.

(default: COMPREHENSIVE). "Example: 'REVIEWED'"

Moreover, the following wording has been added to the tutorial page of obspyDMT:

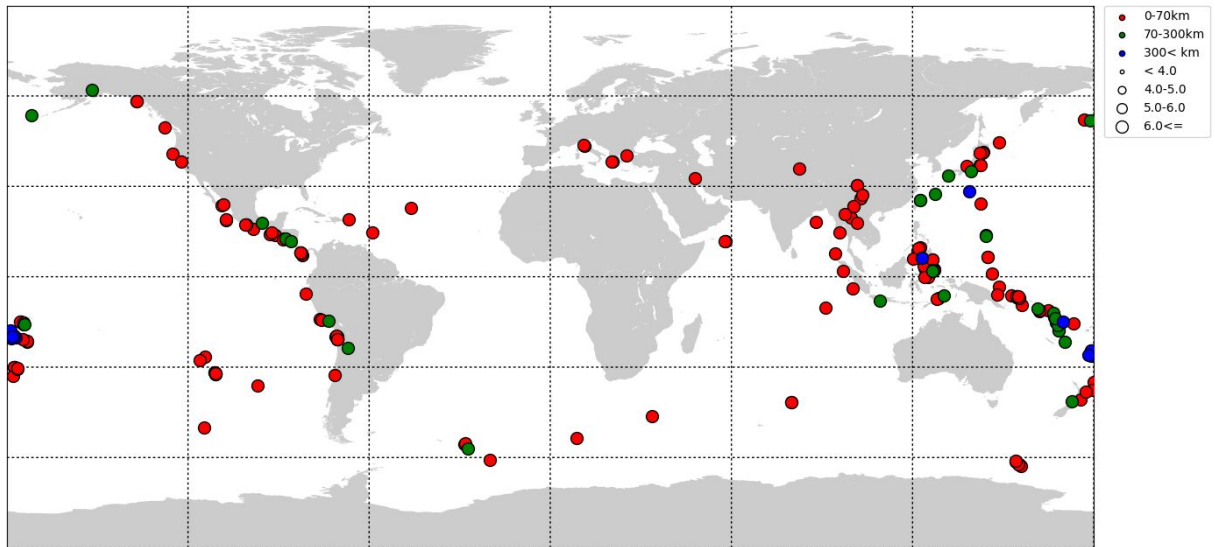
ISC catalog

The International Seismological Centre (ISC) provides two catalogs:

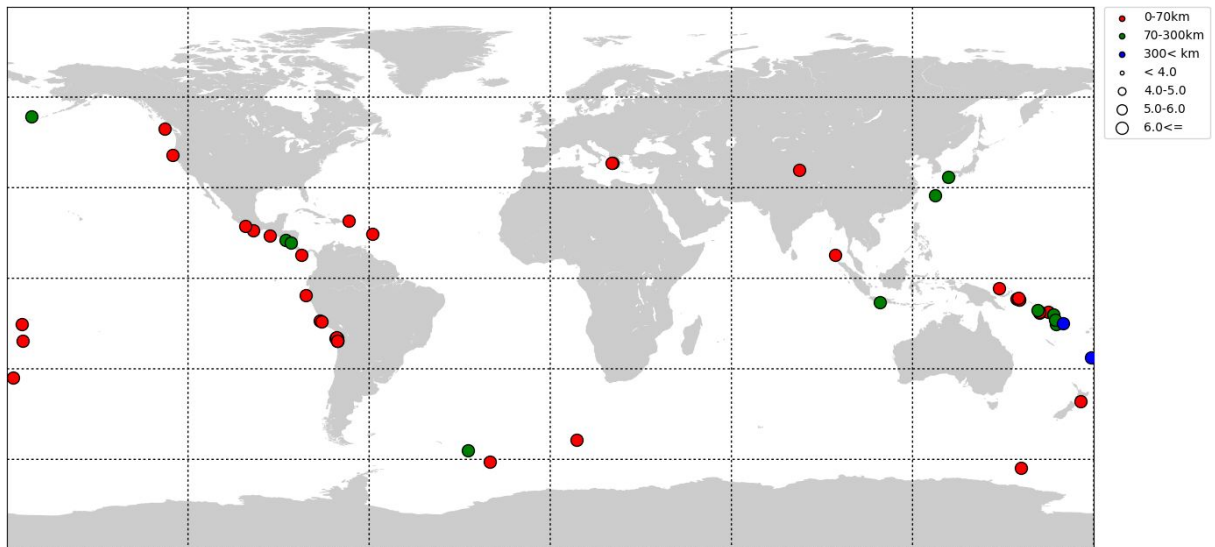
- **COMPREHENSIVE bulletin** contains all events collected by the ISC, including most recent events, which are awaiting review.
- **REVIEWED bulletin** includes all events that have been reviewed and relocated by an ISC analyst.

--isc_catalog option specifies the ISC bulletin type (default: COMPREHENSIVE). Example:

```
obsypyDMT --datapath test_isc_comprehensive --min_date 2014-01-01 --max_date 2015-01-01
--min_mag 6.0 --event_catalog ISC --isc_catalog COMPREHENSIVE --event_info --plot_seismicity
```



Retrieval result for the same request using --isc_catalog REVIEWED :



5) Still in Table 2, for the `--read_catalog`, you mention 3 possibilities. Not all the seismologists are familiar with the 3 formats, I suggest to add some examples in the appendix, or add references to papers or website who can help understand this formats.

REPLY: Agreed, we have added wording to Table 2, as explained in response to item 6) below.

6) Again here I suggest to add another format, which is a simple CSV file with origin time of events lat lon dep and eventually mag, to facilitate the downloading data using catalog that come out from processing of different kind. This can be very helpful for people who create their own catalog for example while detecting low frequency earthquake from cross correlation or tremors. Also, will help the users to retrieve data from catalog published just in papers, which are dedicated to some particular study and do not belong to any agency.

REPLY: This is a good idea. obspyDMT version v2.0.2 can now read a CSV file as an event catalog, as detailed in the tutorial. We have added wording to Table 2 addressing comments 5 & 6:

OLD (Table 2):

Read in an existing local event catalog and proceed.

Currently supported catalog metadata formats:

“QUAKEML”, “NDK”, “ZMAP”.

NEW (Table 2):

Read in an existing local event catalog and proceed. Currently supported catalog metadata formats:

“CSV”, “QUAKEML”, “NDK”, “ZMAP”.

Format of the plain text CSV (comma-separated values) is explained in the obspyDMT tutorial. Refer to obspy documentation for details on QuakeML, NDK and ZMAP formats.

Also the following wording has been added to the tutorial page of obspyDMT:

Read an existing local event catalog

`--read_catalog <PATH>` option flag reads in an existing event catalog located at `<PATH>` and proceeds. Currently supported catalog metadata formats: "CSV", "QUAKEML", "NDK", "ZMAP" (Refer to obspy documentation for details on QuakeML, NDK and ZMAP formats).

CSV format: obspyDMT can read a CSV file as an event catalog. This must be a list of comma-separated values containing some or all of the fields below, one event per line:

event_number,event_id,datetime,latitude,longitude,depth,magnitude,magnitude_type,author,flynn_region,mrr,mtt,mpp,mrt,mrp,mtp,stf_func,stf_duration

File "catalog.txt", generated by obspyDMT in EVENTS-INFO subdirectory provides an example of such a file.

Example:

```
#number,event_id,datetime,latitude,longitude,depth,magnitude,magnitude_type,author,flynn_region,  
mrr,mtt,mpp,mrt,mrp,mtp,stf_func,stf_duration  
1,20110311_054623.a,2011-03-11T05:46:23.200000Z,38.2963,142.498,19.7,9.1,MW,None,NAN,Non  
e,None,None,None,None,None,triangle,164.914
```

datetime, latitude, longitude, depth and magnitude are mandatory. Optional fields may be set to "None", as in the following example where only datetime, latitude, longitude, depth and magnitude are set:

```
#number,event_id,datetime,latitude,longitude,depth,magnitude,magnitude_type,author,flynn_region,  
mrr,mtt,mpp,mrt,mrp,mtp,stf_func,stf_duration  
1,None,2011-03-11T05:46:23.200000Z,38.2963,142.498,19.7,9.1,None,None,None,None,None,  
None,None,None,None,None
```
