

### Overview of ORFEUS Strong-Motion Services and How to Use Them

Webinar – 6 March 2024, 10AM Zürich time

*C. Cauzzi on behalf of the ORFEUS SM-SMC*



The webinar will be recorded - please turn your mics and cameras off

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TODAY

**“European Integrated Data Archive - EIDA”  
services and products:**

- Raw waveforms
- Basic station metadata

**“Strong-Motion / Event-based”  
data services and products:**

- Processed waveforms & PGMs
- Enhanced event and site information

**“Mobile instrument pools”  
services and products:**

Enhancing community access to onshore  
and offshore portable instrumentation

## Rapid-Raw Strong-Motion Database and Associated Services

- Waveforms from EIDA (**on-scale** SM, BB, SP, ...)
- Fully automatic processing (SeisComP *scwfparam*)
  - M3.5+, EMSC alerts

## Engineering Strong-Motion Database and Associated Services

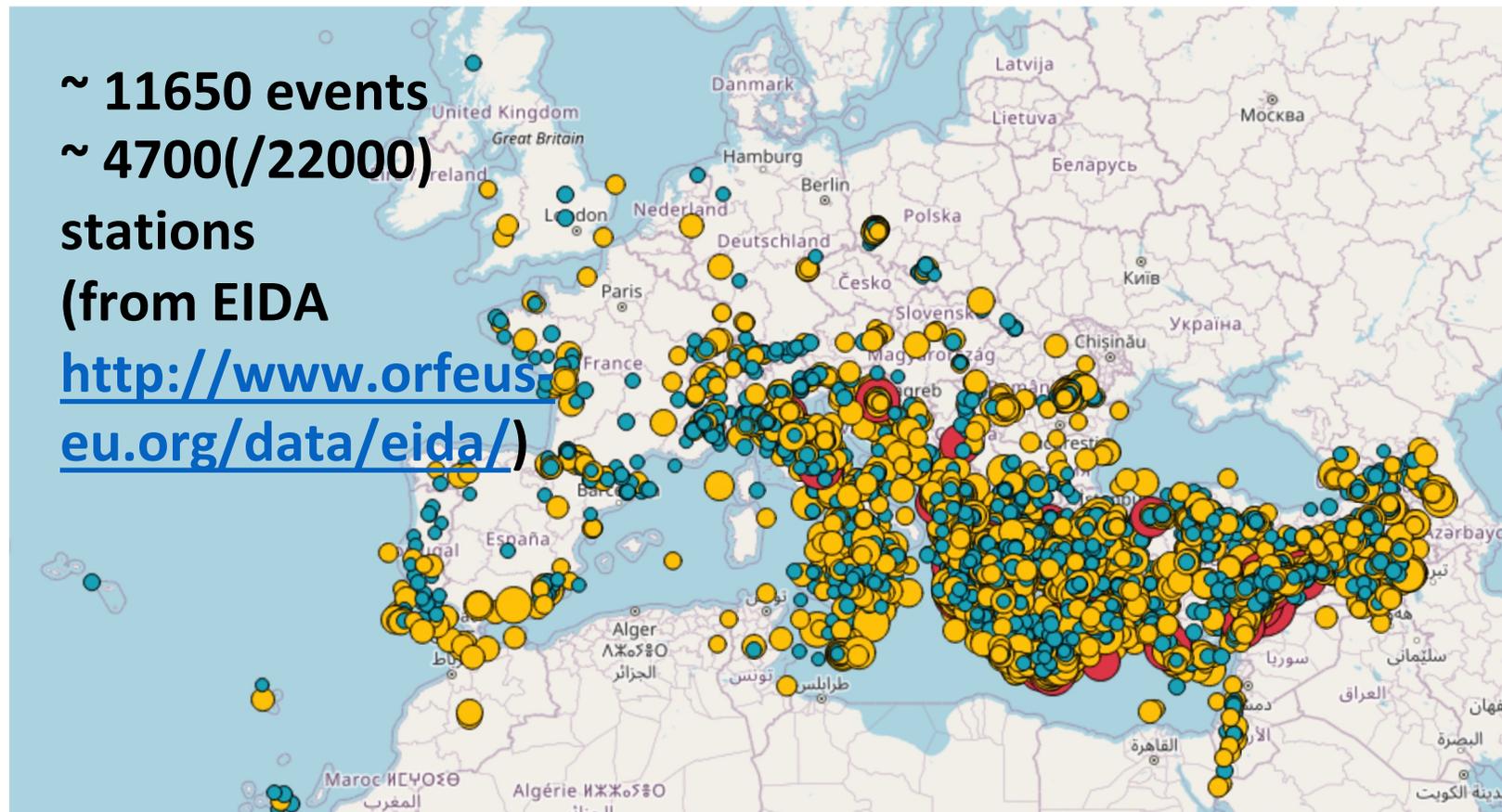
- Waveforms from **EIDA SM + other regional sources**
- Manual, distributed processing, informed by automatic pre-processing
- Enhanced events & station metadata (e.g. site characterization information - siteXML)
  - M4+, EMSC / ISC / literature
- **Reference for seismic hazard studies in Euro-Med**

European ShakeMap System  
(<https://shakemap.eu.ingv.it/>)



SEISMOLOGY

<http://orfeus-eu.org/rrsm/>



<http://orfeus-eu.org/rrsm/>

- Cauzzi C, et al (2016) Introducing the European Rapid Raw Strong-Motion Database. SRL 87:977–986. <https://doi.org/10.1785/0220150271>
- Lanzano G, et al (2021) Accessing European Strong-Motion Data: An Update on ORFEUS Coordinated Services. SRL 92:1642–1658. <https://doi.org/10.1785/0220200398>

# RRSM demo (CC's checklist, webinar is recorded)

<http://orfeus-eu.org/rrsm/> start page

<http://orfeus-eu.org/rrsm/recent/31/> events last month,

- notice “Go to country”

[http://orfeus-eu.org/rrsm/event/20240222\\_0000137/](http://orfeus-eu.org/rrsm/event/20240222_0000137/) to focus on one well-recorded, moderate size event,

- notice map and attenuation plots

o for detailed comparisons point to <https://egsim.gfz-potsdam.de/home>

- order by epidist and show station page ([http://orfeus-eu.org/rrsm/event/20240222\\_0000137/HL/DLFA/](http://orfeus-eu.org/rrsm/event/20240222_0000137/HL/DLFA/))

Back to event page, notice “Download data” tab (Motion data, ShakeMap input - programmatic access)

o [http://www.orfeus-eu.org/odcws/rrsm/1/peak-motion?eventid=20240222\\_0000137](http://www.orfeus-eu.org/odcws/rrsm/1/peak-motion?eventid=20240222_0000137)

o [https://www.orfeus-eu.org/odcws/rrsm/1/shakemap?eventid=20240222\\_0000137](https://www.orfeus-eu.org/odcws/rrsm/1/shakemap?eventid=20240222_0000137)

o [https://www.orfeus-eu.org/odcws/rrsm/1/shakemap?eventid=20240222\\_0000137&type=event](https://www.orfeus-eu.org/odcws/rrsm/1/shakemap?eventid=20240222_0000137&type=event)

Back to event page, download miniSEED for one station,

o <https://eida.gein.noa.gr/fdsnws/dataselect/1/query?network=HL&station=DLFA&starttime=2024-02-22T11:20:03&endtime=2024-02-22T11:31:03>

o show hot to get xml by changing the URL to ‘station’ and add “level=response” (use curl on Terminal),

o <https://eida.gein.noa.gr/fdsnws/station/1/query?network=HL&station=DLFA&starttime=2024-02-22T11:20:03&endtime=2024-02-22T11:31:03&level=response>

o BTW, <https://www.fdsn.org/networks/citation/>

o show basic processing in **Jupyter** (<https://polybox.ethz.ch/index.php/s/XrCNHrDaPTPERDn>)

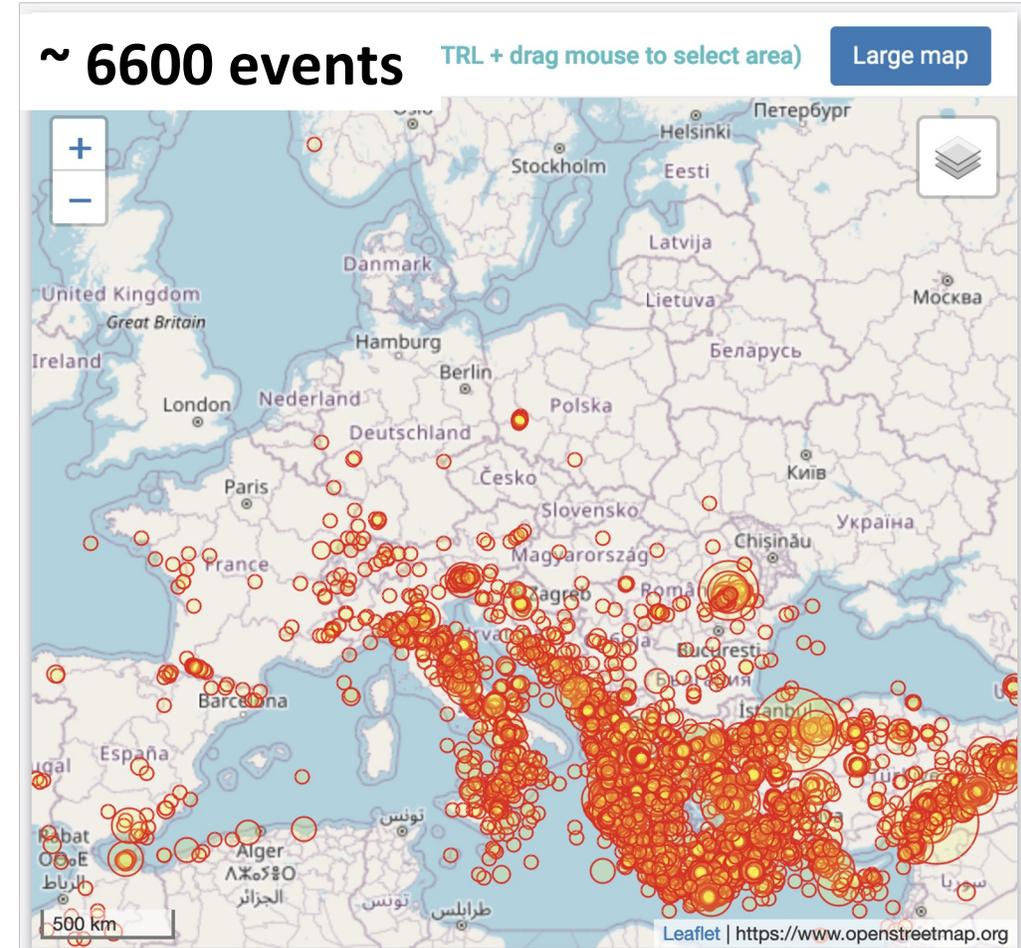
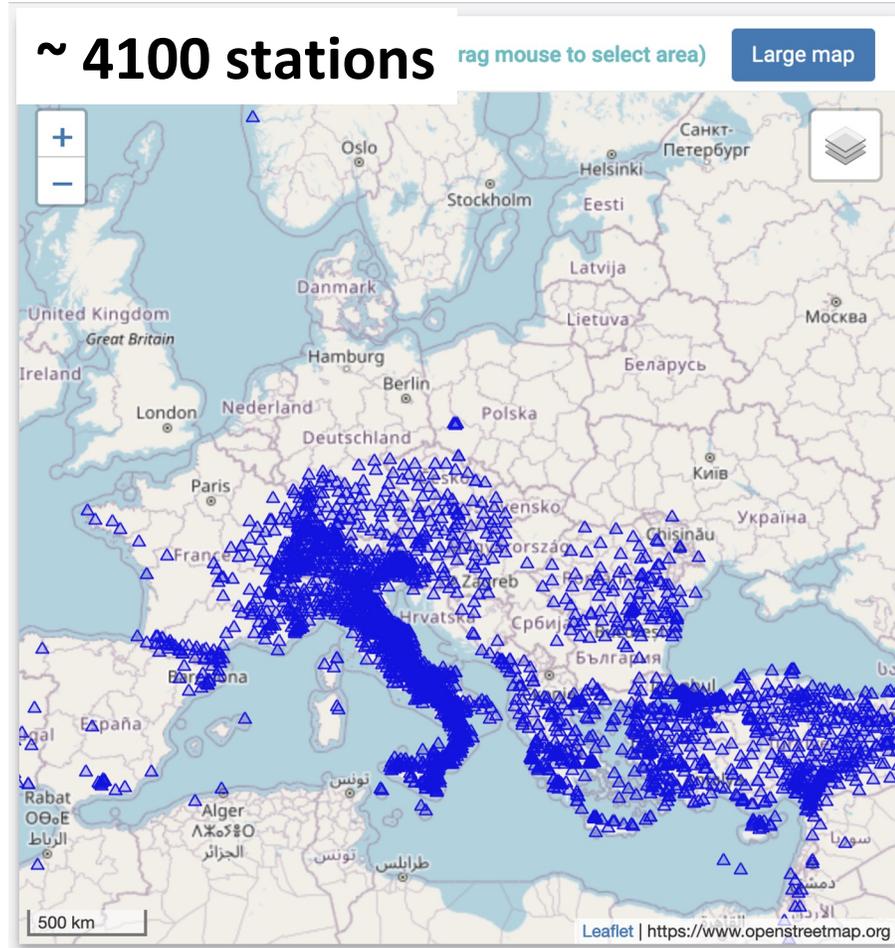
Back to event page, “Download data” tab, “Processed Waveforms”, load in **Jupyter**

- [https://www.orfeus-eu.org/odcws/rrsm/1/waveform?eventid=20240222\\_0000137](https://www.orfeus-eu.org/odcws/rrsm/1/waveform?eventid=20240222_0000137)

(<https://polybox.ethz.ch/index.php/s/XrCNHrDaPTPERDn>)

<http://orfeus-eu.org/esm/>

<http://esm-db.eu/>



<http://orfeus-eu.org/esm/>  
<http://esm-db.eu/>

- Paolucci R, et al (2011) Record Processing in ITACA, the New Italian Strong-Motion Database. In: Akkar S, Gülkan P, van Eck T (eds) Earthquake Data in Engineering Seismology: Predictive Models, Data Management and Networks. Springer Netherlands, Dordrecht, pp 99–113
- Luzi L, et al (2016) The Engineering Strong-Motion Database: A Platform to Access Pan-European Accelerometric Data. SRL 87:987–997. <https://doi.org/10.1785/0220150278>
- Lanzano G, et al (2021) Accessing European Strong-Motion Data: An Update on ORFEUS Coordinated Services. SRL 92:1642–1658. <https://doi.org/10.1785/0220200398>
- Mascandola C, et al (2023) ESMpro: A Proposal for Improved Data Management for the Engineering Strong-Motion Database (ESM). Seismological Research Letters 94:961–974.  
<https://doi.org/10.1785/0220220246>

# ESM demo (CC's checklist, webinar is recorded)

<http://orfeus-eu.org/esm/> start page, then “Events”

<https://esm-db.eu/#/event/search>,

- notice how to restrict search based on “Filters”
- search for eventID = 20240222\_0000137 to compare with previous case

[https://esm-db.eu/#/event/INT-20240222\\_0000137](https://esm-db.eu/#/event/INT-20240222_0000137) event page

- go to “Records”, explain first row, follow link for first entry

[https://esm-db.eu/#/waveform/HL/DLFA/00/INT-20240222\\_0000137/HN](https://esm-db.eu/#/waveform/HL/DLFA/00/INT-20240222_0000137/HN) station record page

- go through tabs until “Download”,
- spend one minute on seismic network citation then proceed to download “All” as ASCII(new file name)
- comment on other formats as you wait for download
- show content and point to one “\*CV.ASC” file
- show header with text editor, notice sampling interval and physical units (notice not really RAW!)
- load and plot “raw” waveform in Jupyter (<https://polybox.ethz.ch/index.php/s/XrCNHrDaPTPERDn>)

Back to <https://esm-db.eu/#/event/search>, look for M>6 in Italy, pick this event ([https://esm-db.eu/#/event/EMSC-20161030\\_0000029](https://esm-db.eu/#/event/EMSC-20161030_0000029)) to show one example with fault geometry, use record link at NRC to show station information (<https://esm-db.eu/#/station/IT/NRC>)

Go to [https://esm-db.eu/#/data\\_and\\_services/web\\_services](https://esm-db.eu/#/data_and_services/web_services), notice to shakemap and event-data → event-data to be demonstrated by E Russo in two weeks, along with “flatfile” (<https://esmdev.mi.ingv.it/esmws/flatfile/1/>)

Go to “Tools” and <https://esm-db.eu/#/rexel> and the associated webservices point to the webinar by S Sgobba (<https://polybox.ethz.ch/index.php/s/POTLU58aj2zYNNp>).

## Members of SMMB and SMTS (on ORFEUS Forum) & many others:

A Michelini, A Marmureanu, A Predoiu, A Sharma, B Margaris, C Cauzzi, C Felicetta, C Mascandola, D Bindi, D Cambaz, D Giardini, D Kalafat, D Stanko, E Sokos, E Maufroy, E Tepeugur, E Riga, E Russo, F Gallovic, F Hollender, F Turhan, F Malcioglu, G Lanzano, G Weatherill, H Sueleyman, J Bienkowski, J Clinton, J Douglas, K Konstantinidou, K Pitilakis, K Vanneste, L Faenza, L Luzi, M Cocco, M D'Amico, M Manakou, M Carman, N Melis, N Theodoulidis, O-J Ktenidou, P Gueguen, P Kaestli, R Rupakhety, R Sleeman, S Akkar, U Hancilar, V Perron, V Poggi, Z Roumelioti, ...

**and sorry for any omissions (and typos ...)!**

<https://forum.orfeus-eu.org/> → Sign Up

The screenshot shows the ORFEUS Forum website interface. At the top, there is a navigation bar with the forum name, a search bar, and buttons for 'Sign Up' and 'Log In'. Below the navigation bar, there is a sidebar with a menu of categories and tags. The main content area displays a list of forum topics, each with a title, a category icon, a user profile picture, and statistics for replies, views, and activity time.

Topic	Replies	Views	Activity
ISC internet down General services, downtime	0	8	18h
Faculty position in seismology at Freie Universität Berlin Job Announcements	0	10	4d
Unscheduled downtime at Résif Maintenance services, downtime	0	17	9d
Upcoming ORFEUS Webinars Meetings, Workshops, Training	0	44	13d
New user interface to view EIDA data availability General software	0	33	18d
HeaMES 2024 Call for Abstracts General	2	117	20d
Earth Systems Summer School 2024: Applications Open Meetings, Workshops, Training	0	38	20d
Infrastructure maintenance at ODC (2024-02-02) Maintenance services	1	33	25d
Call for abstract ESC2024, 22-27 September 2024 Corfu, Greece - SESSION04 Meetings, Workshops, Training	0	34	29d

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