Crowdsourced earthquake felt reports collected via the LastQuake service (2014 - 2021 + examples from 2022) (https://doi.org/10.5880/GFZ.2.6.2023.001)

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1. License

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3. Data Description

The European-Mediterranean Seismological Centre (EMSC) is a non-profit scientific organization aiming at establishing and operating a rapid earthquake detection system globally and in particular in the European and Mediterranean regions as well as facilitating exchange between seismological institutes. The EMSC has been a pioneer in citizen seismology by collecting in-situ information on the earthquake impact directly from the witnesses. The EMSC has been collecting citizen intensity felt reports at global scale for many years via two channels: its websites and its “LastQuake” smartphone application. These felt reports are collected through a set of 12 cartoons representing the 12 levels of the European Macroseismic Scale (Grünthal, 1998). They provide rapid information on how the

earthquake's impact is felt by the local population. The EMSC felt reports were shown to be consistent with the USGS Did You Feel It? (Wald et al., 2011) responses and with manually derived macroseismic datasets (Bossu et al., 2017).

3.1.Sampling method

Felt reports are collected via the European Mediterranean Seismological Center's service LastQuake where users submit a felt report via Smartphone, a mobile website or a regular website. More information on data collection can be found in Bossu et al. (2017).

3.2.Data processing

Data processing is limited to the association of a felt report to an earthquake: The user associates the report manually to a registered earthquake. EMSC performs a consistency check concerning reported distance, time, and intensity, and remove outliers. Felt reports can be submitted without an earthquake association. Some of these orphaned reports are associated manually, however, the majority is disregarded.

4. File description

4.1.File inventory

We provide four „.csv" files:

1. "2023-001_Bossu-et-al_felt_reports_2014_2021.csv" contains an exhaustive set of felt reports collected for earthquakes between January 2014 and December 2021, for earthquakes that received at least 10 felt reports.
2. "2023-001_Bossu-et-al_catalog_2014_2021.csv" contains an earthquake catalog corresponding to the felt reports in "felt_reports_2014_2021.csv".
3. "2023-001_Bossu-et-al_felt_reports_2022.csv" contains felt reports for a selection of 11, globally distributed, well reported earthquakes from 2022.
4. "2023-001_Bossu-et-al_catalog_2022.csv" contains an earthquake catalog corresponding to the felt reports in "felt_reports_2022.csv".

4.2. Description of data tables

"2023-001_Bossu-et-al_felt_reports_2014_2021.csv" and "2023-001_Bossu-et-al_felt_reports_2022.csv" use the following file format:

Column header	unit	Description
	dimensionless	Enumerating ID
lon	Decimal degrees	Longitude of the reporting location
lat	Decimal degrees	Latitude of the reporting location
intensity	Dimensionless	(Pseudo) Intensity obtained from mapping a single macroseismic observation to the EMS-98 macroseismic scale
quest_date	UTC	Date and time of report submission
evid	Dimensionless	Earthquake identifier (EMSC catalog ID)
dt	Seconds	Time difference between the earthquake and the report submission

epidist	Kilometers	Epicentral distance between earthquake epicenter and reporting location
device	Dimensionless	Device the report was submitted from. One of: “app” (Smartphon application) “mobile” (Mobile website) “desktop” (Regular website)
ev_mag	Demensionless (mixed types)	Earthquake magnitude
ev_date	UTC	Date and time of earthquake
ev_lon	Decimal degrees	Hypocenter longitude
ev_lat	Decimal degrees	Hypocenter latitude

“felt_reports_2014_2021.csv” and “felt_reports_2022.csv” data format

“2023-001_Bossu-et-al_catalog_2014_2021.csv” and “2023-001_Bossu-et-al_catalog_2022.csv” use the following file format:

Column header	**unit**	**Description**
ev_unid		UNID earthquake ID
ev_event_time	UTC	Event time
ev_latitude	Decimal degrees	Event latitude
ev_longitude	Decimal degrees	Event longitude
ev_mag_type		Magnitude type
ev_mag_value		Magnitude value
ev_depth	km	Earthquake depth
ev_region		Earthquake region
ev_nbtestimonies		Number of felt reports for this event

“catalog_2014_2021.csv” and “catalog_2022.csv” data format

5. References

Bossu, R., M. Landès, F. Roussel, R. Steed, G. Mazet-Roux, S. S. Martin, and S. Hough (2017). Thumbnail-based questionnaires for the rapid and efficient collection of macroseismic data from global earthquakes. Seismological Research Letters 88, no. 1, 72–81. https://doi.org/10.1785/0220160120

Grünthal, G. (Ed.)(1998): European Macroseismic Scale 1998 (EMS-98), (Cahiers du Centre Européen de Géodynamique et de Séismologie ; 15), Luxembourg : Centre Européen de Géodynamique et de Séismologie, 99 p. https://doi.org/10.2312/EMS-98.full.en

Wald, D.J., V. Quitoriano, B. Worden, M. Hopper, and J.W. Dewey (2011). USGS "Did You Feel It?" internet-based macroseismic intensity maps, Annals of Geophysics 54(6), 688-707, https://doi.org/10.4401/ag-5354