

GRSN Demo Dataset

This example dataset consists of seismic data recorded with the German Regional Seismic Network (GRSN). Generally, the network contains the German seismic backbone broad-band network, the Graefenberg broad-band array, the short-period stations of the GERES array (German stations of the International Monitoring System, IMS, in the frame of the Comprehensive Test Ban Treaty, CTBT) and some associated stations, partly broad-band and partly short-period. It is operated by the Federal Institute for Geosciences and Natural Resources (BGR) in cooperation with a number of national partner institutions. The data of the GR network are continuous and not subject to any access restrictions. The first stations in this network were the array elements of Graefenberg installed between 1976 and 1980. The Graefenberg array is the first digital broad-band array on earth. It has a continuous data history from 1976 until today.

The compiled data set contains records of 4 seismic stations of the GRSN mostly located in the southern part of Germany and two stations from France (HOHE) and Switzerland (ROMAN, see Figure 1). The data set contains local seismic events from two different tectonic regimes: (1) The area at Gaienhofen at lake Constance, South Germany and (2) the area at La Wantzenau, near Strassbourg, France. The area at the lake Constance caused four different natural earthquakes which are part of the data set, with magnitudes between $0.7 < M_l < 3.0$.

Beside these events, the data set contains one induced earthquake ($M_l=1.7$) which is caused by the EGS-project (Enhanced Geothermal System) near Strassbourg, France. There, many seismic events occurred in the last few months with magnitudes up to $M_l=3.9$ (on June 26th 2021). Although that this project is stopped since December 2020, seismicity occurs frequently.

Start time of the dataset:	06/30/2021 01:30 UTC
End time of the dataset:	06/30/2021 04:30 UTC
Global sampling rate:	100.0 Hz

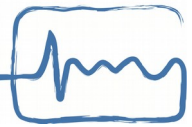


Figure 1. Location of the 4 selected stations of the GRSN network (TNS, STU, BFO, FUR), the seismic stations ROMAN (Switzerland) and HOHE (France) as well as the two tectonic regimes with seismic events in the data set.



Station	Location	Latitude	Longitude	Altitude (m a.s.l.)
BFO	Black Forest Observatory	48.33	8.33	589
FUR	Fürstenfeldbruck	48.163	11.275	570
HOHE	Hohengoeft	48.658742	7.484304	274
ROMAN	Romanshorn, Forsthaus	47.5643	9.33601	442
STU	Stuttgart	48.771	9.194	360
TNS	Kleiner Feldberg (Taunus)	50.222	8.447	815

Table 1. Station details of the chosen stations of the GRSN and the French and Suisse stations for this example dataset.

Date and onset-time (UTC)	Origin	Magnitude	Remarks
2021-06-29 23:44:58	Gaienhofen	1.1	
2021-06-29 23:45:14	Gaienhofen	3.0	
2021-06-29 23:46:10	Gaienhofen	1.6	Partly 'masked' by the coda of the Ml=3.0 event before
2021-06-30 01:03:07	Gaienhofen	0.7	clear at BFO, hard to see at ROMAN
2021-06-30 03:28:24	La Wantzenau	1.7	

Table 2. Five seismic events in the data set you may try to identify.

The first three events from Gaienhofen occurred shortly after each other, so that the signals, especially of the third event, are 'riding' on the signal coda of the first events. You may try to identify the onsets of these three events with respect to the epicentral distance of each station.

The weakest event from Gaienhofen can only be seen clearly at the station BFO, while the nearest station ROMAN is too noisy for the detection of this event.

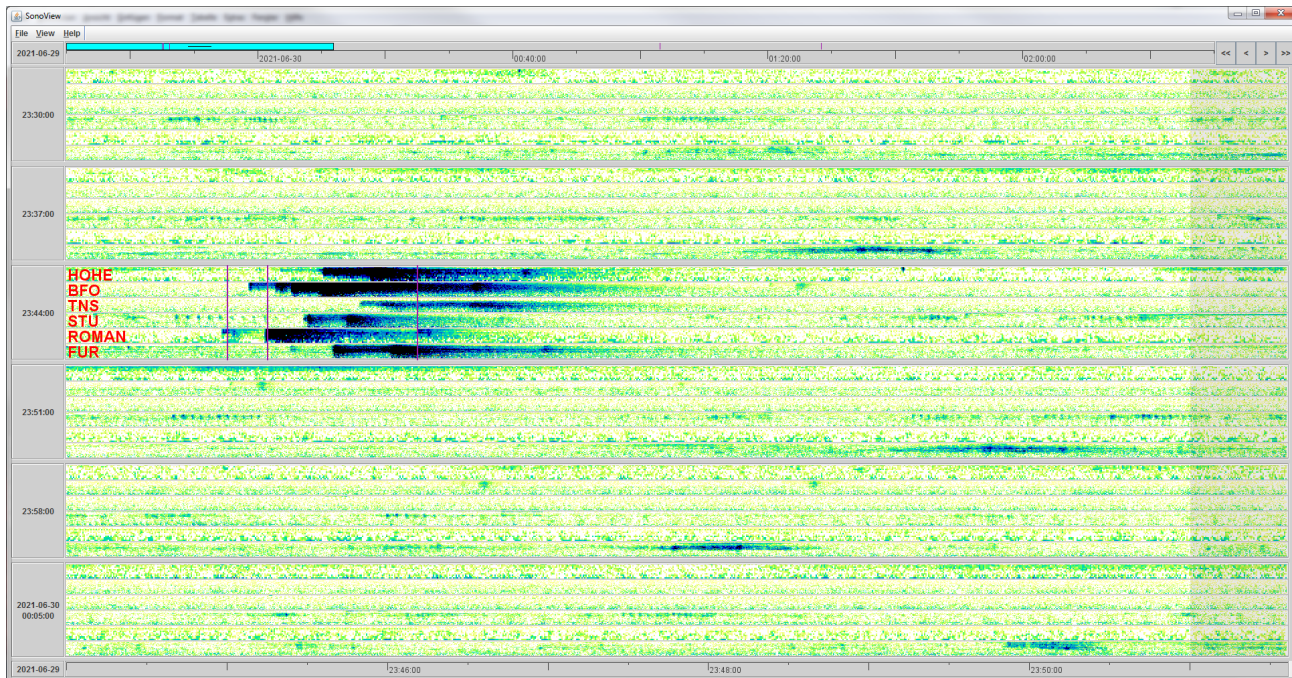
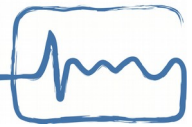


Figure 2. Screenshot of SonoView showing approx. 45 minutes of continuous seismic data with the three events from the Gaienhofen area.

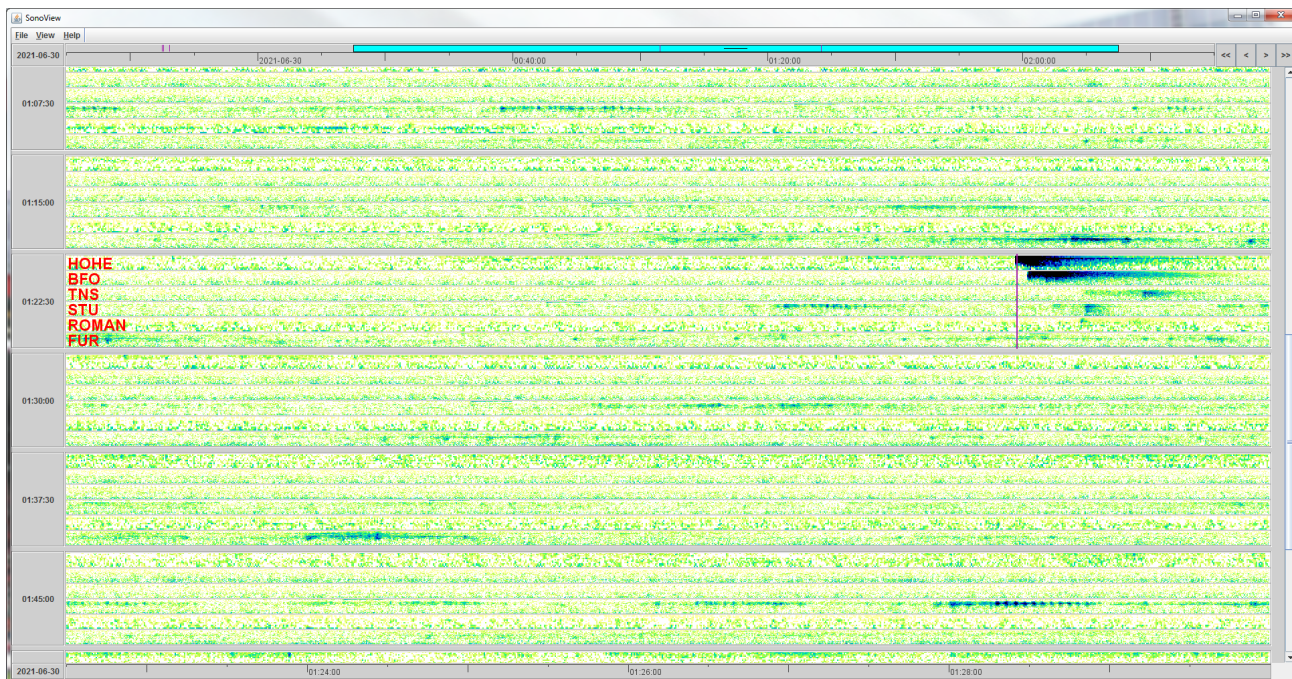


Figure 3. Screenshot of SonoView showing approx. 45 minutes of continuous seismic data with the induced seismic event from La Wantzenau.

Sonicona

seismic software & services



References

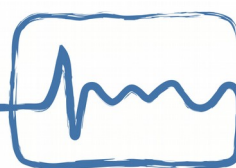
Information regarding the GRSN network can be found here: https://www.bgr.bund.de/EN/Themen/Seismologie/Seismologie/Seismometer_Stationen/Stationsnetze/d_stationsnetz_node.html

Contact:

If you need any assistance or if you have any questions regarding the software and or dataset please contact us:

Sonicona

seismic software & services



Bismarckstrasse 136
72072 Tübingen
Germany

Phone +49 (0)7071-9355-66

E-Mail info@sonicona.com

Web www.sonicona.com