

## Sample data

### Railway Field Laboratory

**Client:** Swiss confederation; Federal Offices for the Environment (FOEN) and Transport (FOT),  
CH-3003 Bern  
The FOEN and the FOT are offices of the Federal Department of the Environment, Transport, Energy and Communications (DETEC).

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**Remarks:** This report was published on behalf the Swiss Federal Office for the Environment (FOEN) and Transport (FOT). The consultant is responsible for the content and all data displayed.

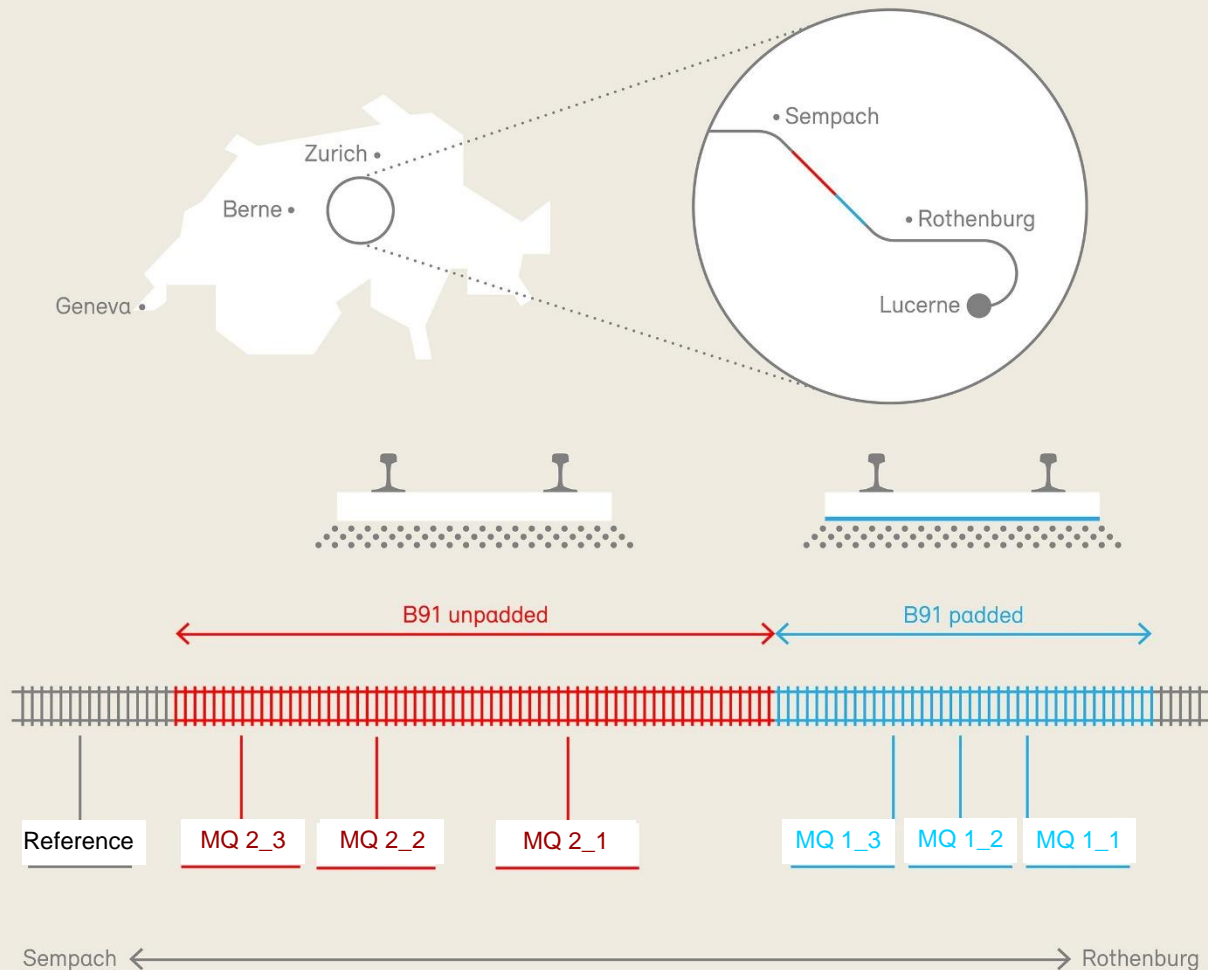
**Version:** V1

**Date:** 15.2.2023

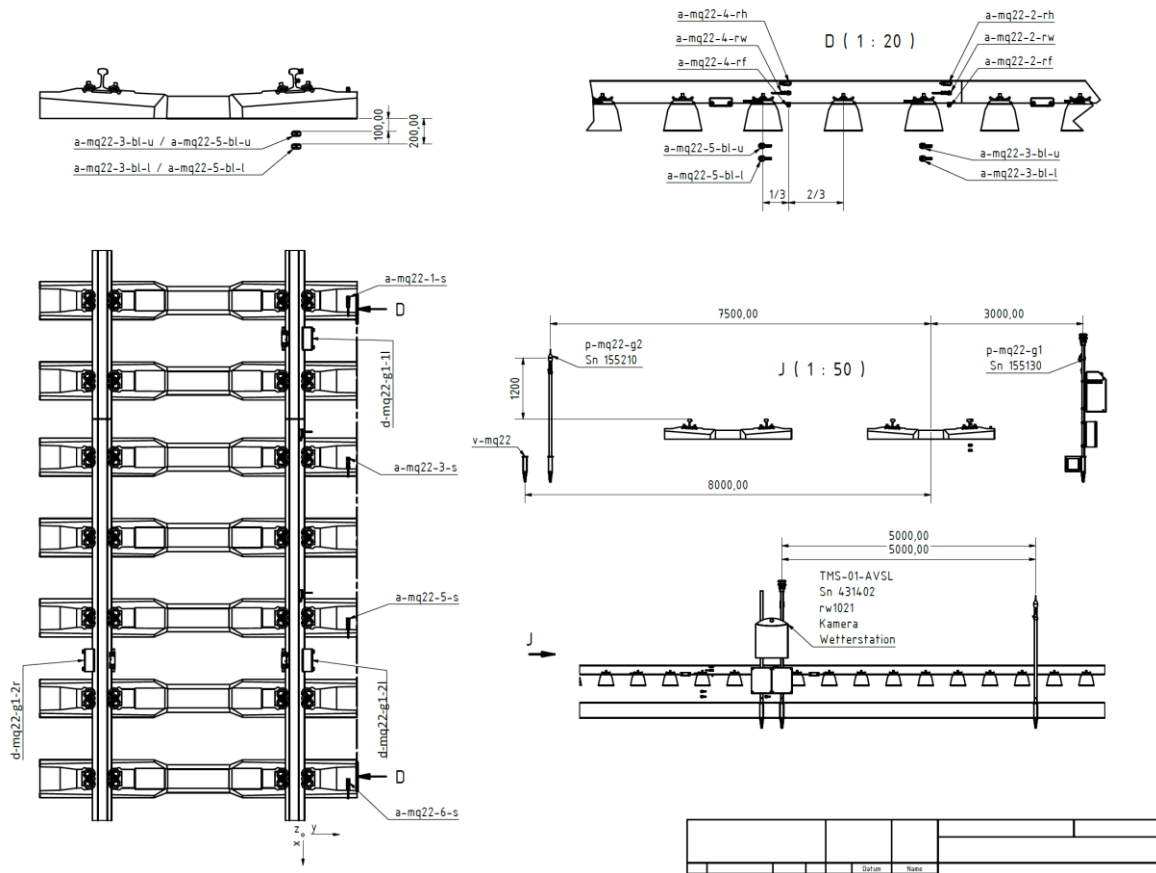
|  |                                    |
|--|------------------------------------|
| 1. Das Fahrbahnlabor: Lage und Messquerschnitte                    | 4                                  |
| 2. Messsensoren und Kenngrößen                                     | Fehler! Textmarke nicht definiert. |
| 3. Beispieldaten für eine Zugvorbeifahrt am Messquerschnitt MQ 2_2 | 6                                  |

## 1. Railway Field Laboratory: Location and measurement cross-sections

### Overview presentation of the measurement track



## 2. Measuring sensors and measuring quantities



The following sensors are installed at all measuring cross-sections:

- 2 microphones (d=3,0 m und d=7,5m)
- 4 uniaxial acceleration sensors sleeper, vertical (1-s, 2-s, 3-s and 4-s)
- 2 uniaxial acceleration sensors Rail vertical (2-rf and 4-rf)
- 2 uniaxial acceleration sensors rail web horizontal (2-rw and 4-rw)
- 2 uniaxial acceleration sensors rail head horizontal (2-rh and 4-rh)
- 4 triaxial acceleration sensors ballast  
d = 10 cm below bottom edge of sleeper (3-bl-u, 5-bl-u)  
d = 20 cm below bottom edge of sleeper (3-bl-l, 5-bl-l)
- Axle detectors (g1-1l, g1-2l, g1-2r and g2-2r)

The following parameters are also collected:

- axle load
- indirect roughness
- soil vibration (x, y, z) at MQ 1\_2 and MQ 2\_2
- weather data at MQ 2\_2
- EVN-numbers of the trains at MQ REF
- track decay rate (EN 15461) and rail roughness (EN 15610) at all measuring sections

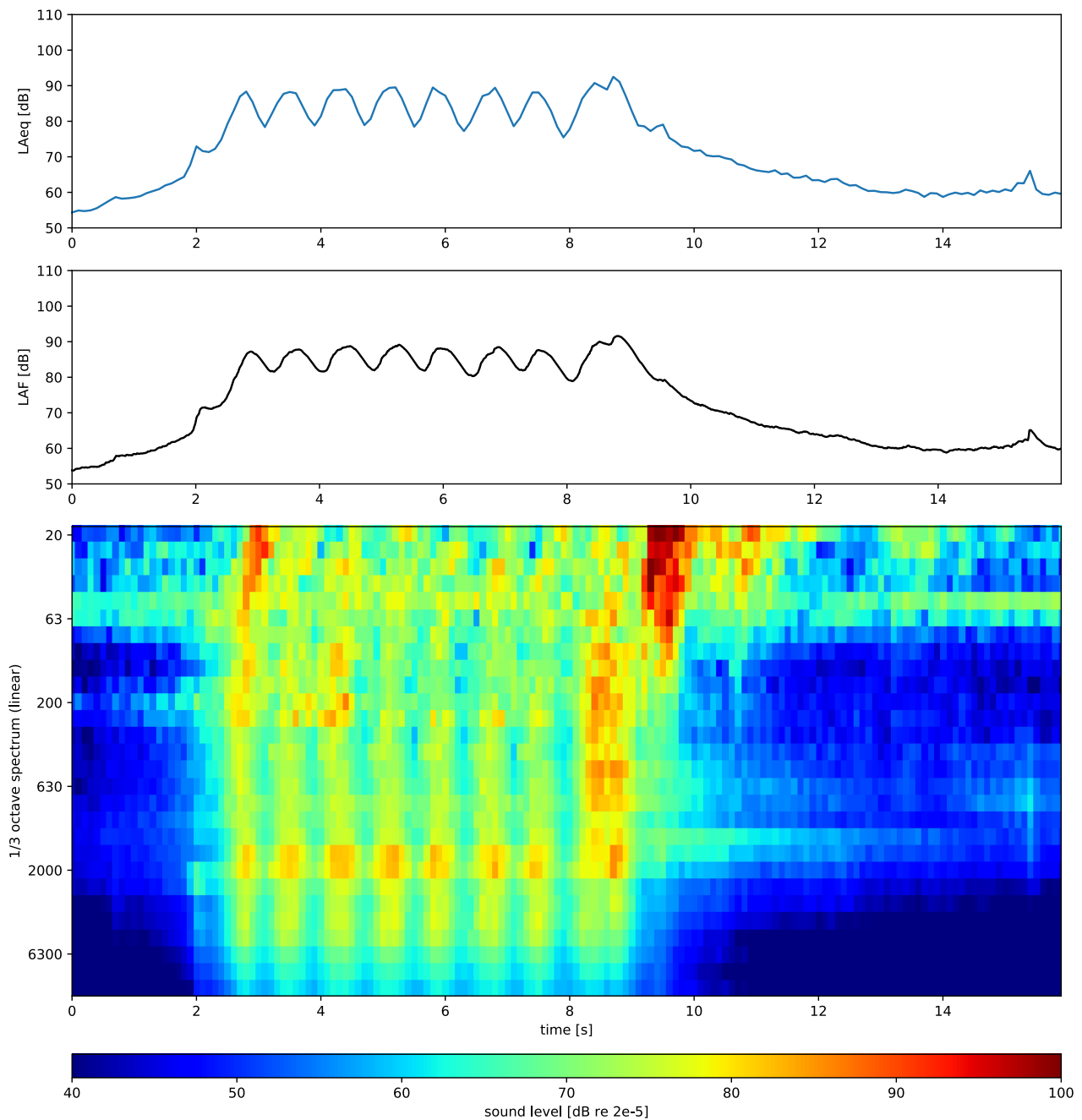
### 3. Sample data for a train pass-by, MQ 2\_2

The sample data show the raw time data, third-octave spectra and narrowband spectra of the measurement data.

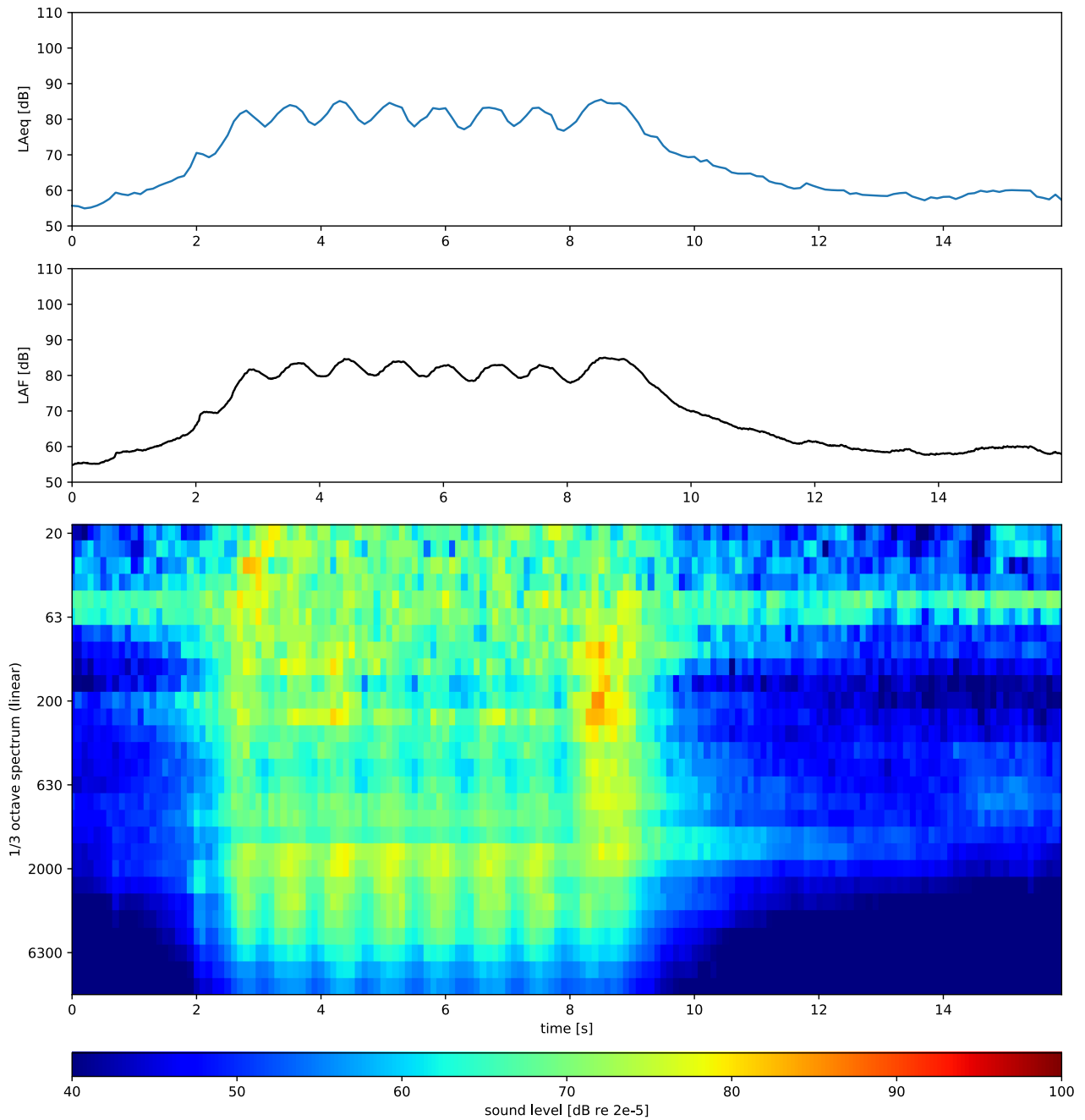
For the microphones, the  $L_{Aeq}$ ,  $L_{AF,max}$  and the third-octave band spectrum are shown.

#### Microphones (d=3,0 m and d=7,5m)

MQ22 / M30 / MQ22\_230125\_134136+1.h5

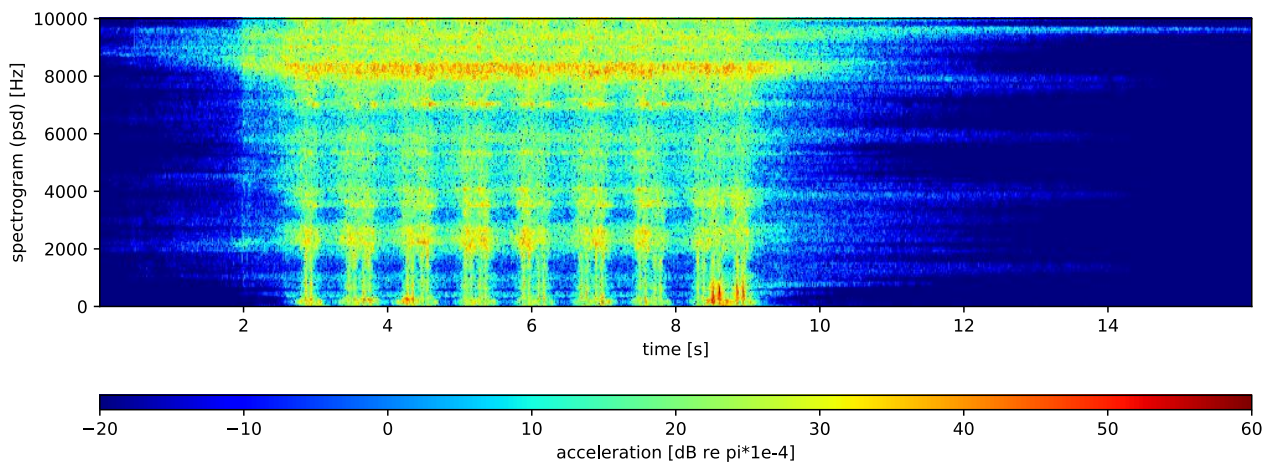
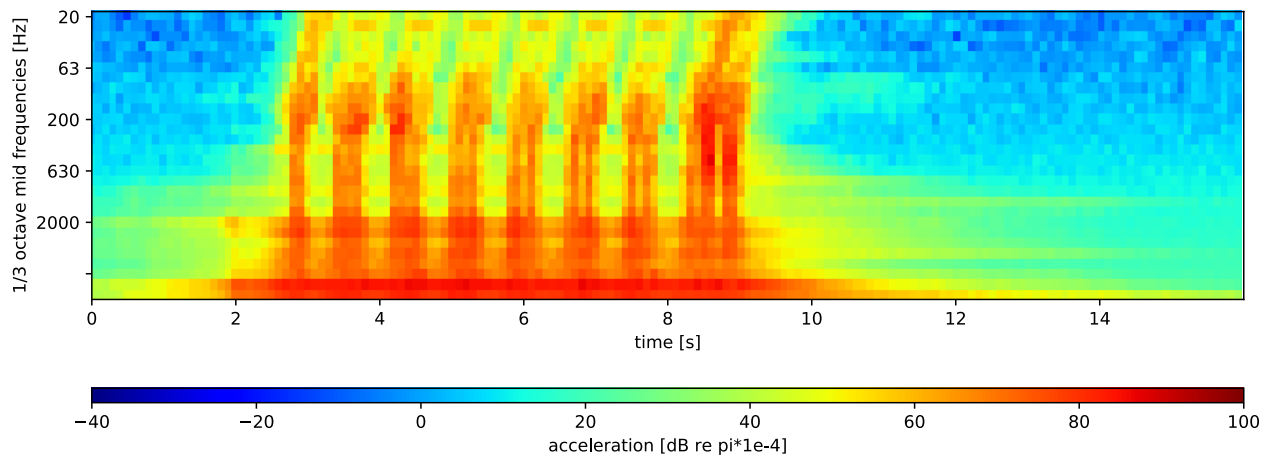
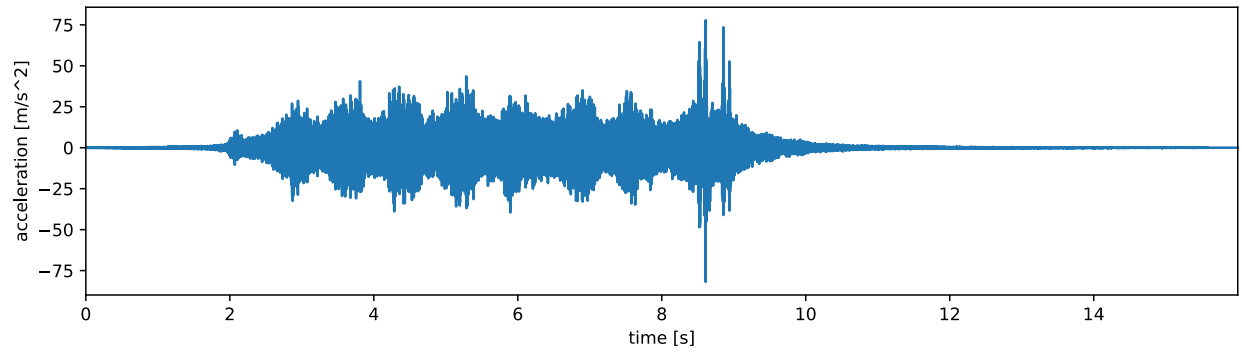


MQ22 / M75 / MQ22\_230125\_134136+1.h5



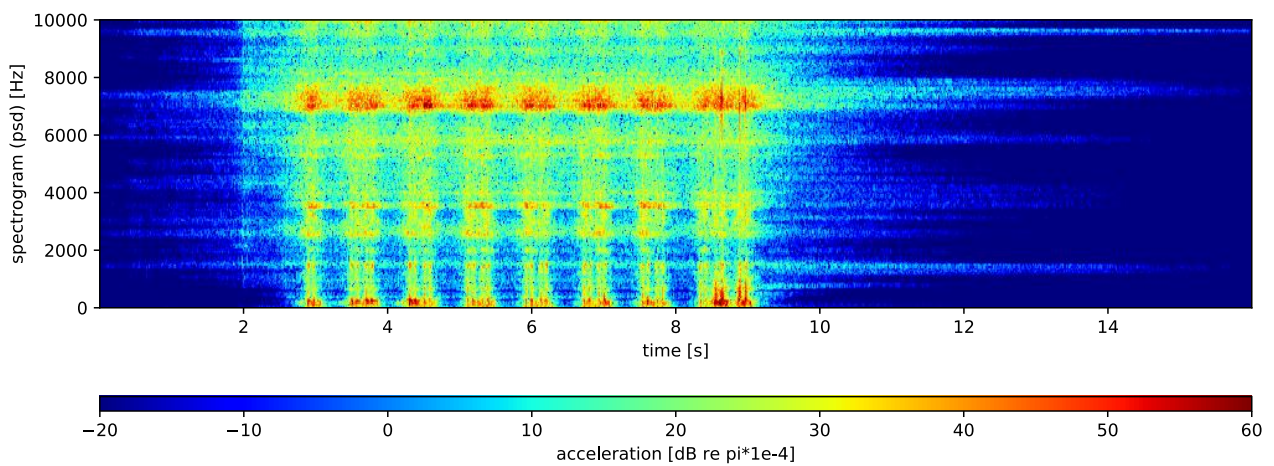
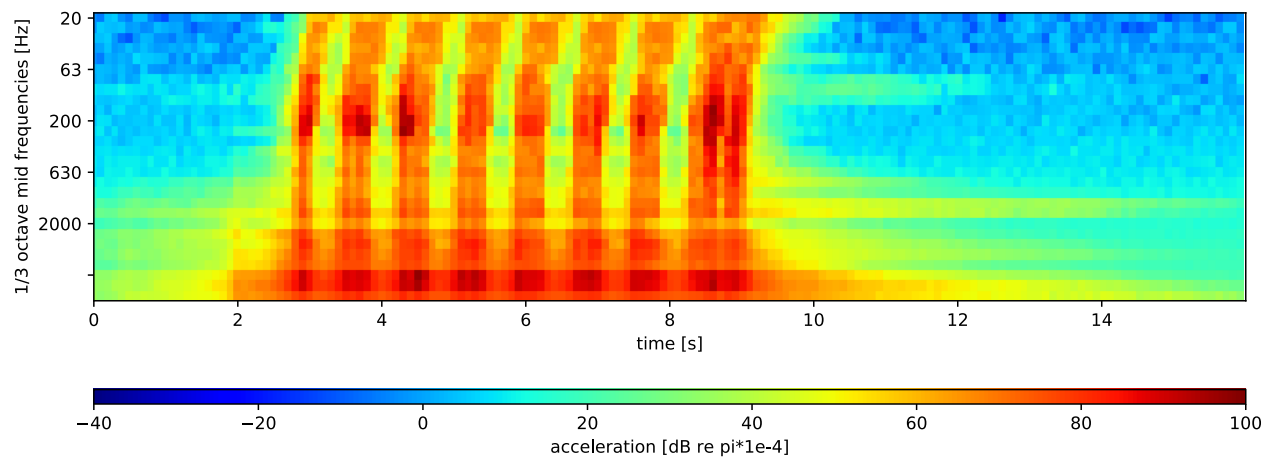
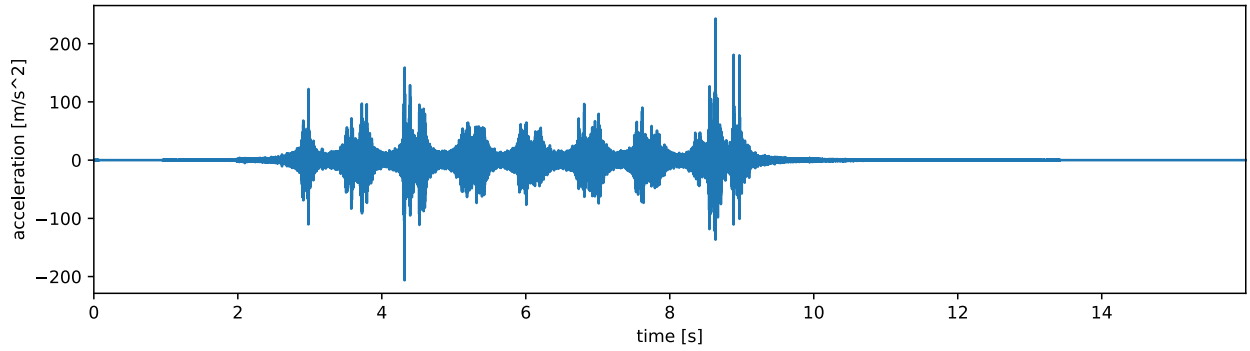
## Acceleration sensors sleeper, vertical (1-s and 3-s)

MQ22 / 1s / MQ22\_230125\_134136+1.h5





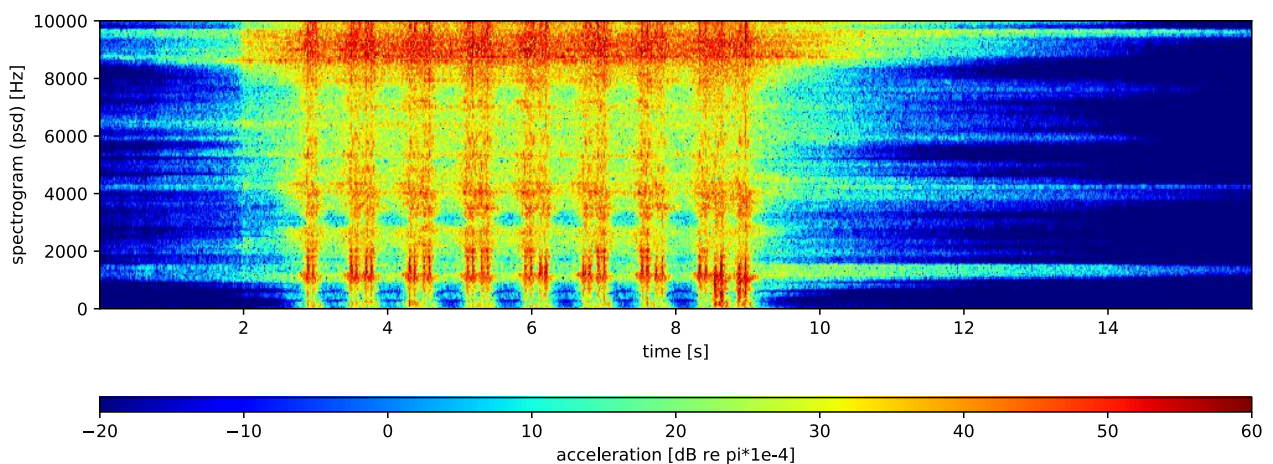
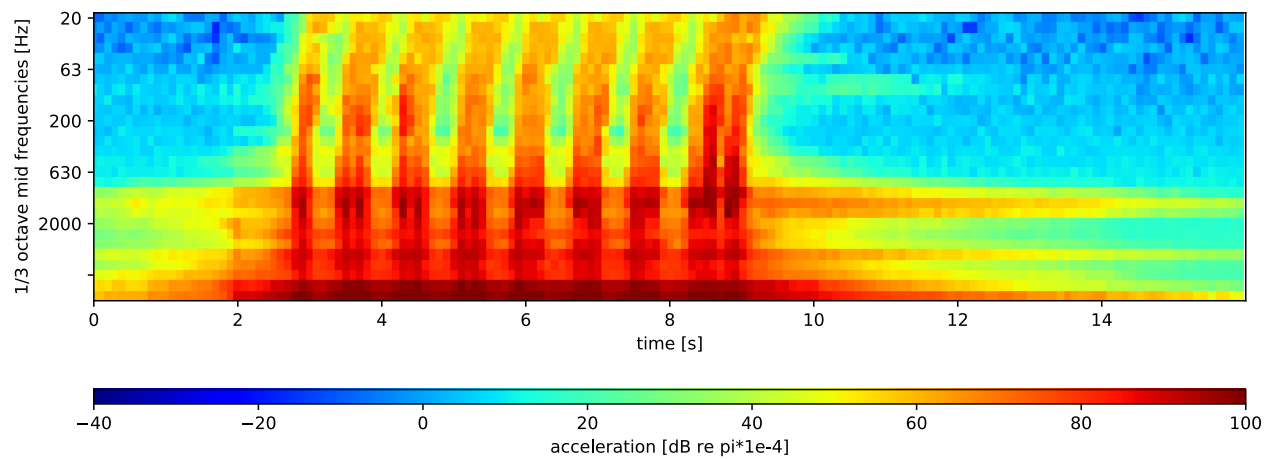
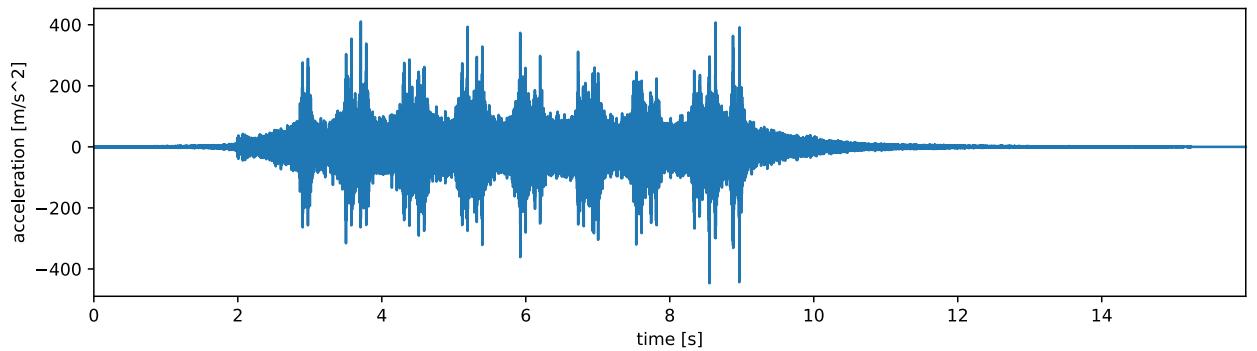
MQ22 / 3s / MQ22\_230125\_134136+1.h5



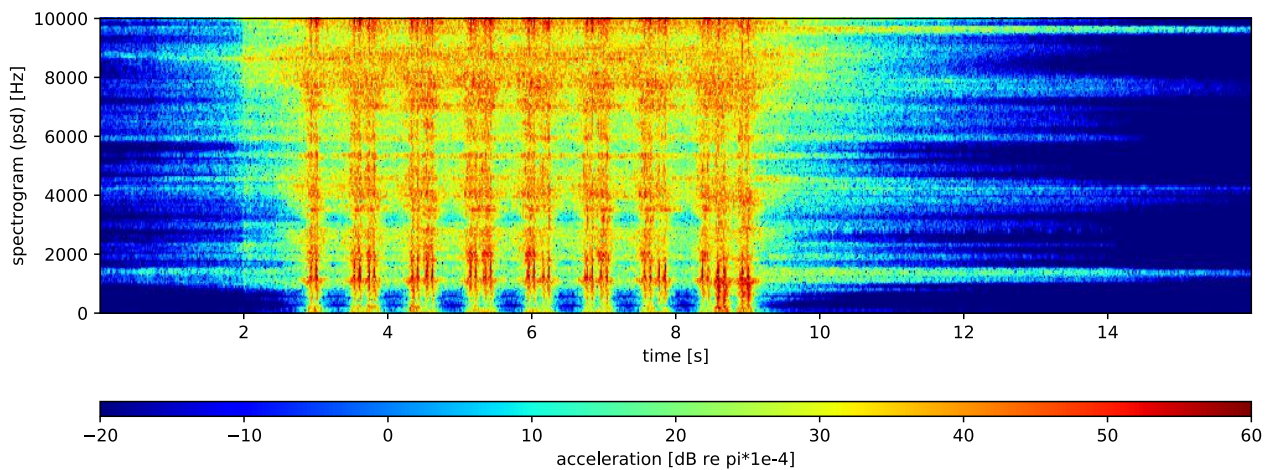
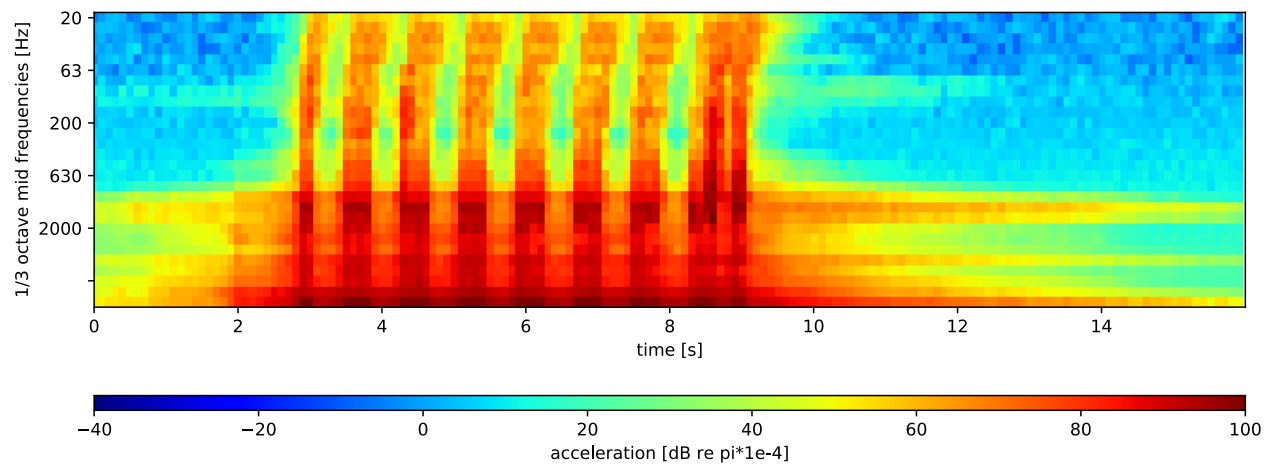
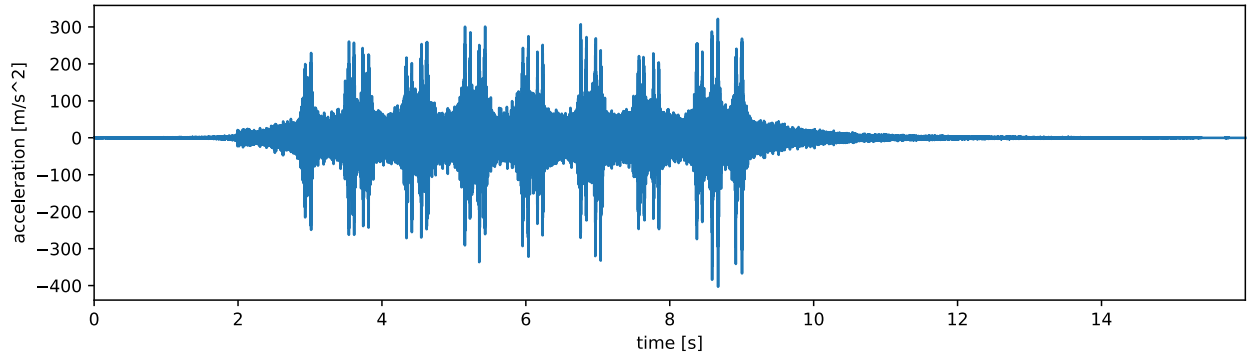
Zeit [s]

## Acceleration sensors rail vertical (2-rf and 4-rf)

MQ22 / 2rf / MQ22\_230125\_134136+1.h5

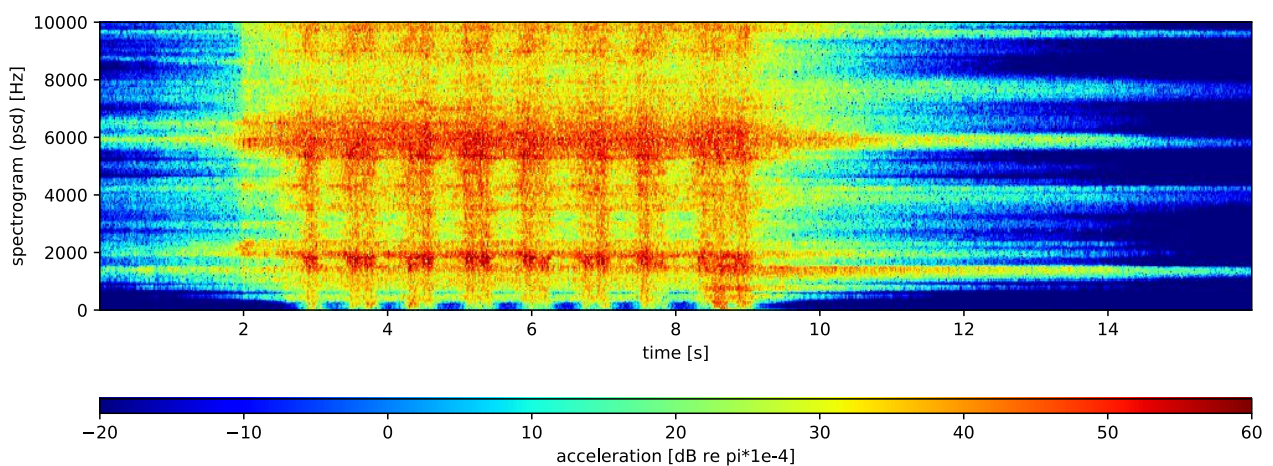
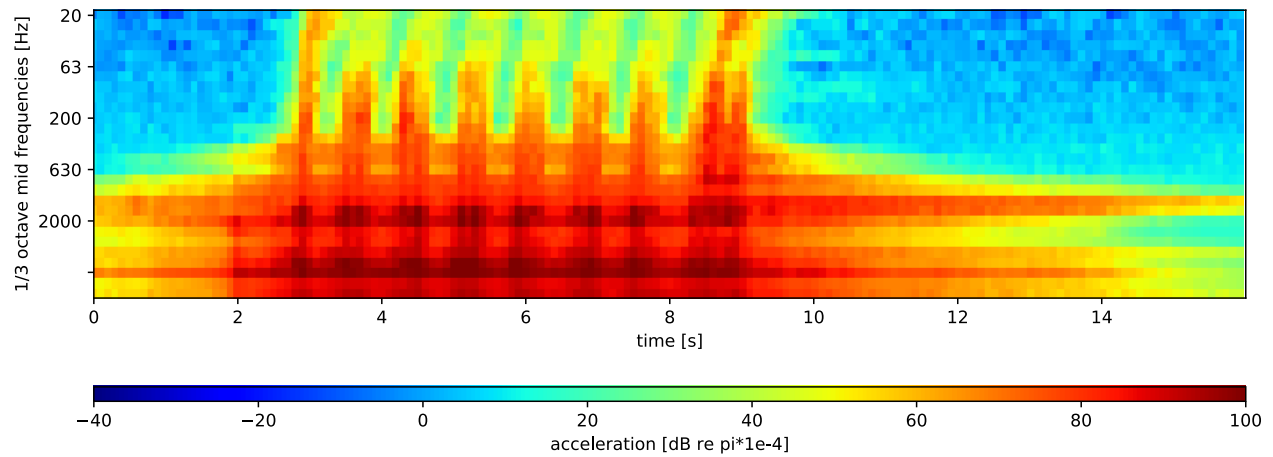
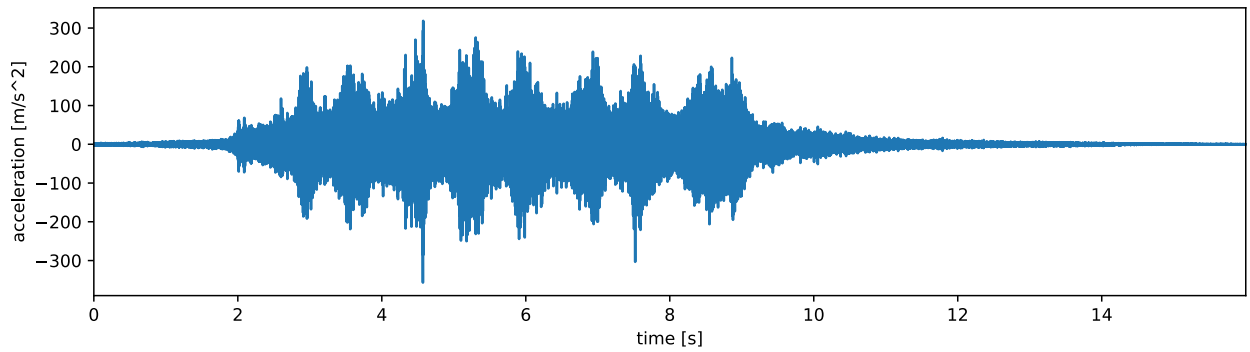


MQ22 / 4rf / MQ22\_230125\_134136+1.h5

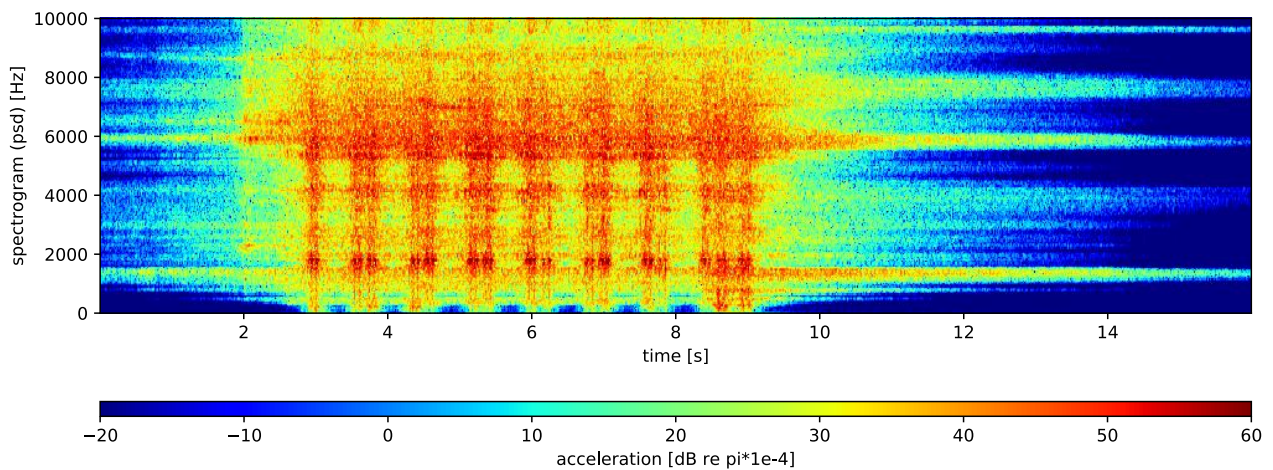
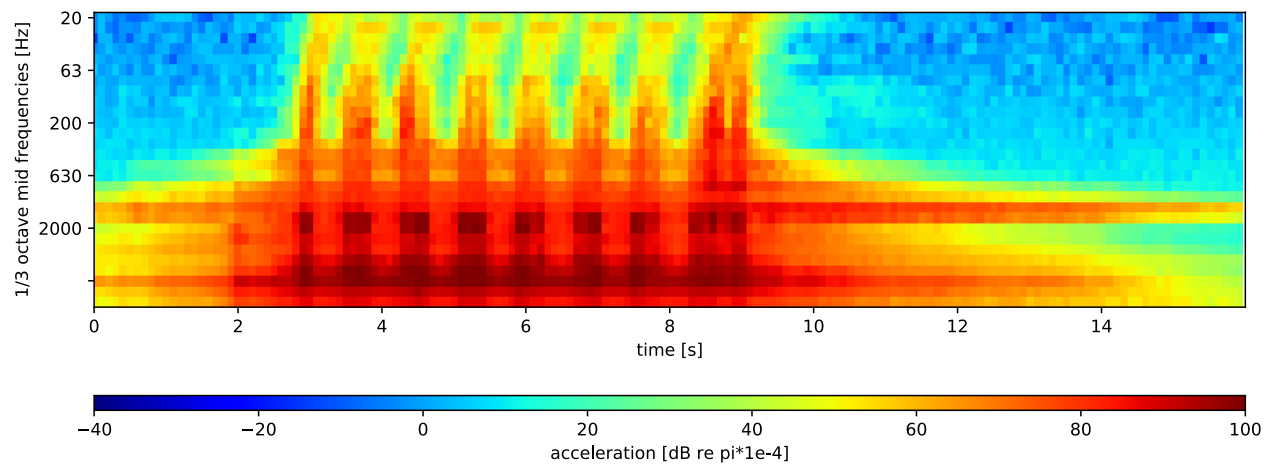
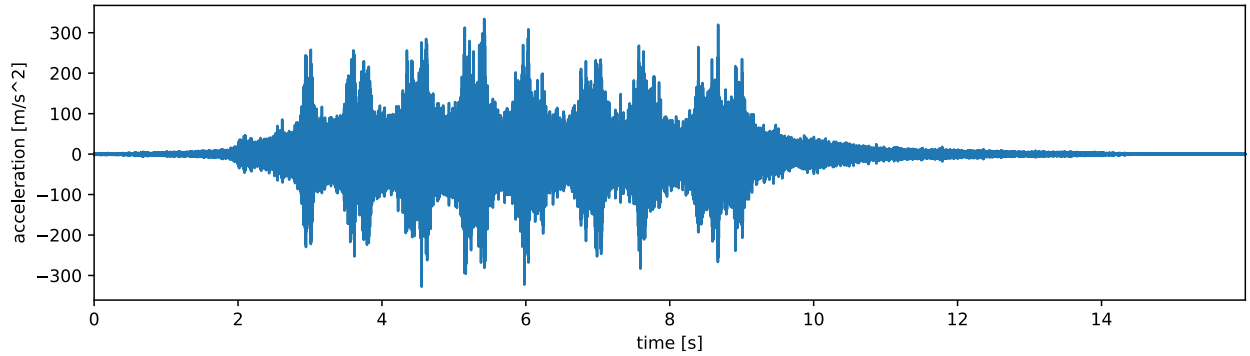


## Acceleration sensors rail web horizontal (2-rw and 4-rw)

MQ22 / 2rw / MQ22\_230125\_134136+1.h5



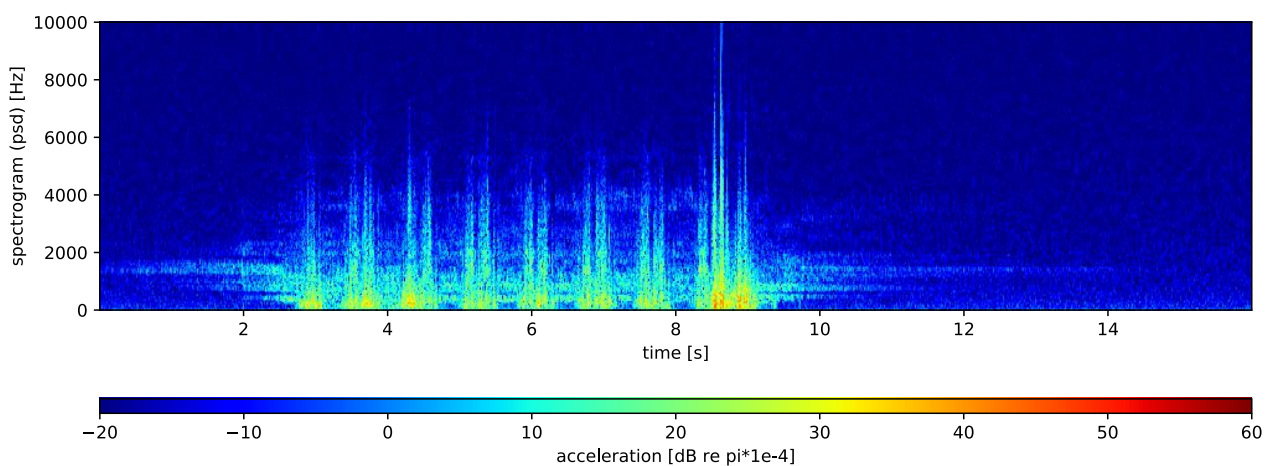
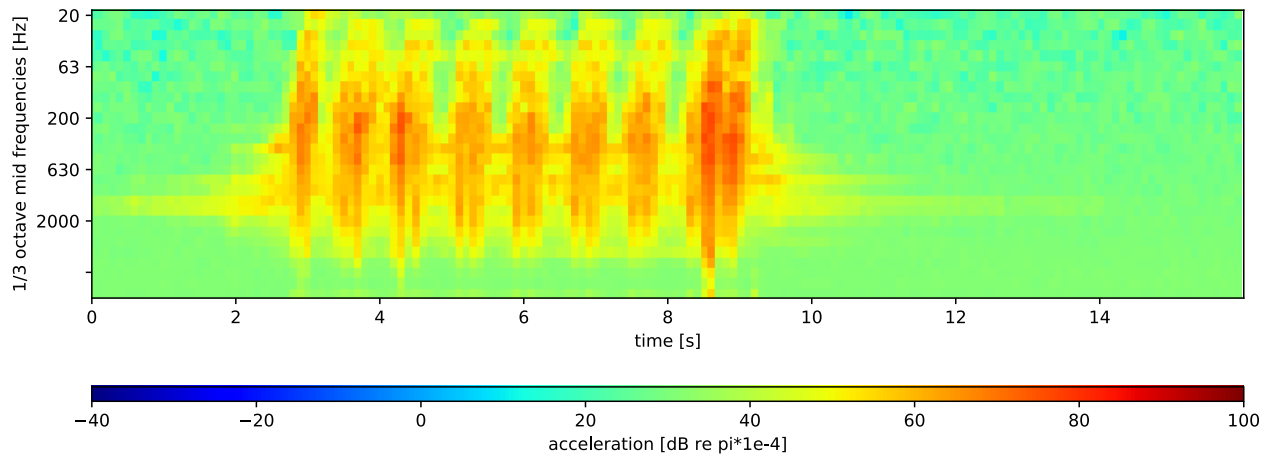
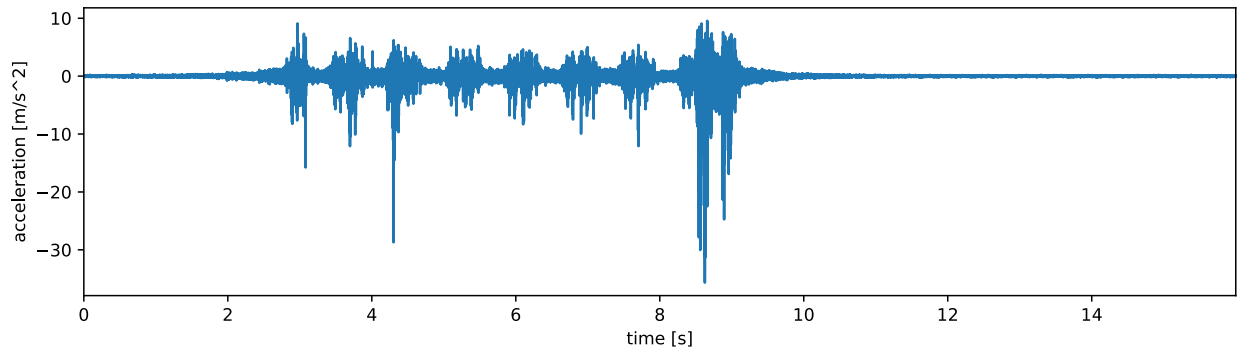
MQ22 / 4rw / MQ22\_230125\_134136+1.h5



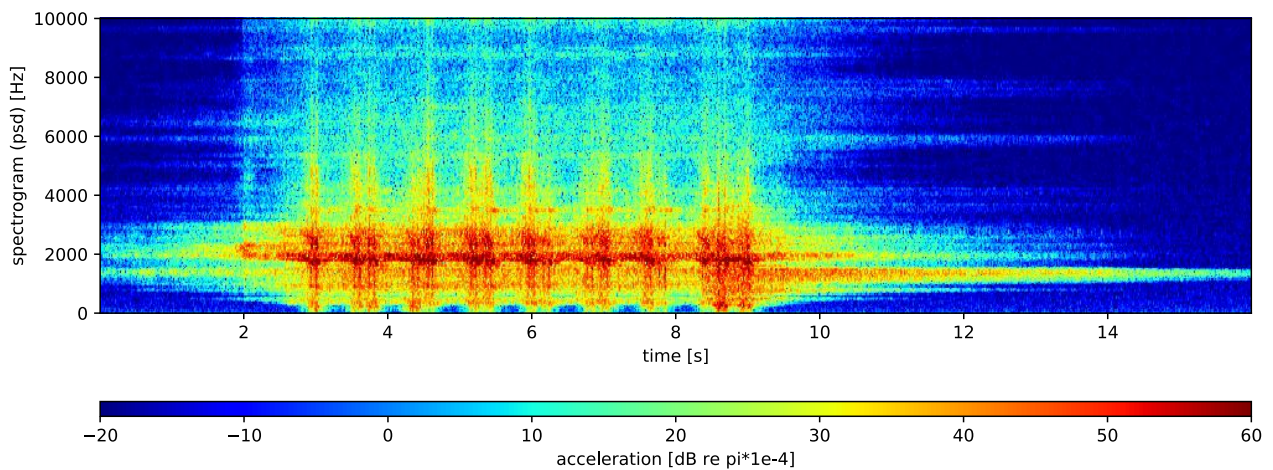
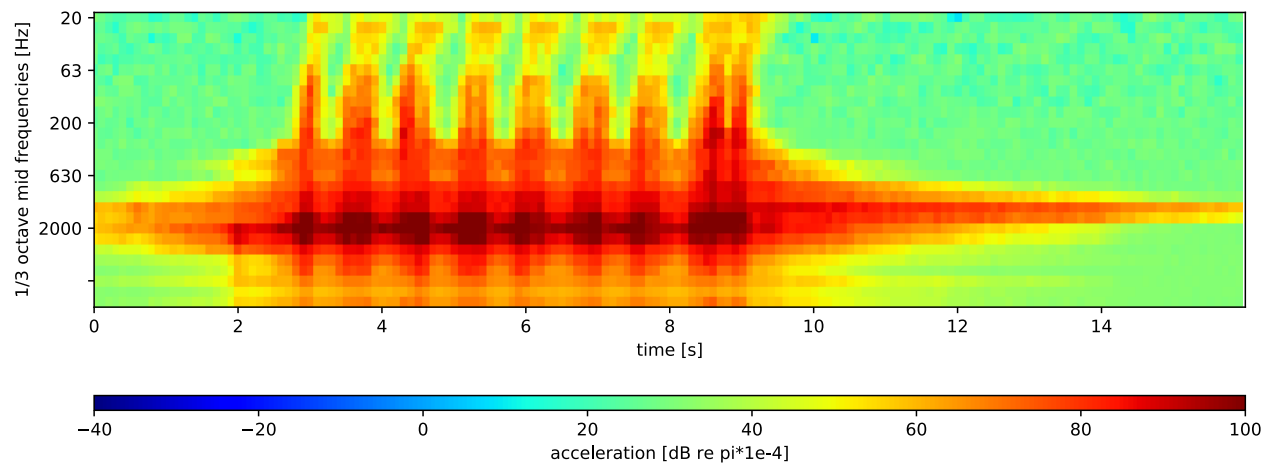
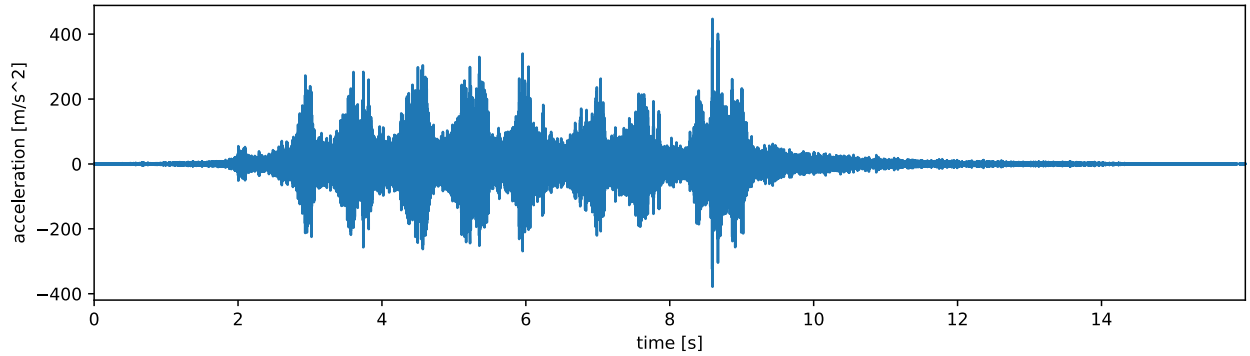


## Acceleration sensors rail head horizontal (2-rh and 4-rh)

MQ22 / 2rh / MQ22\_230125\_134136+1.h5

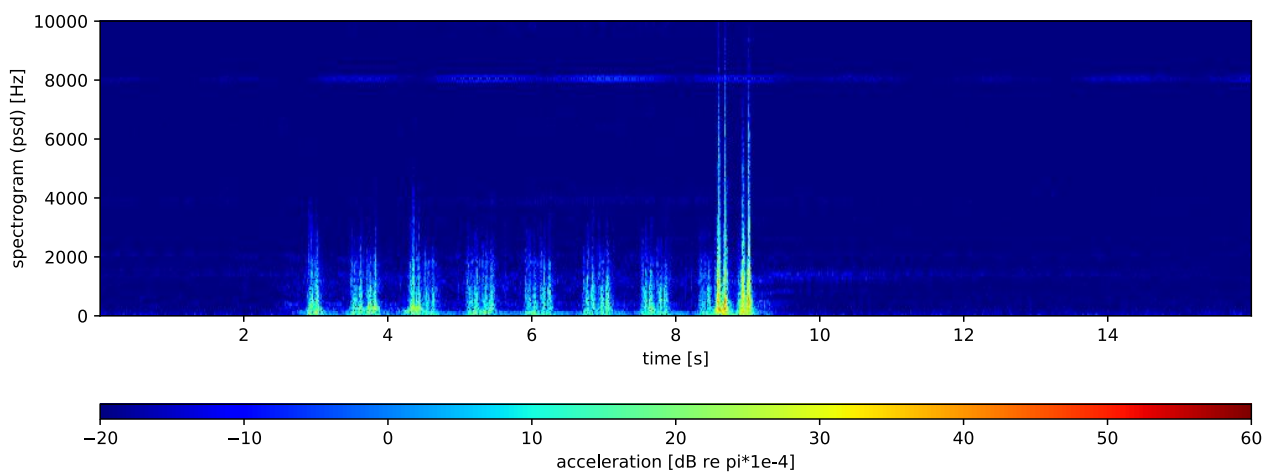
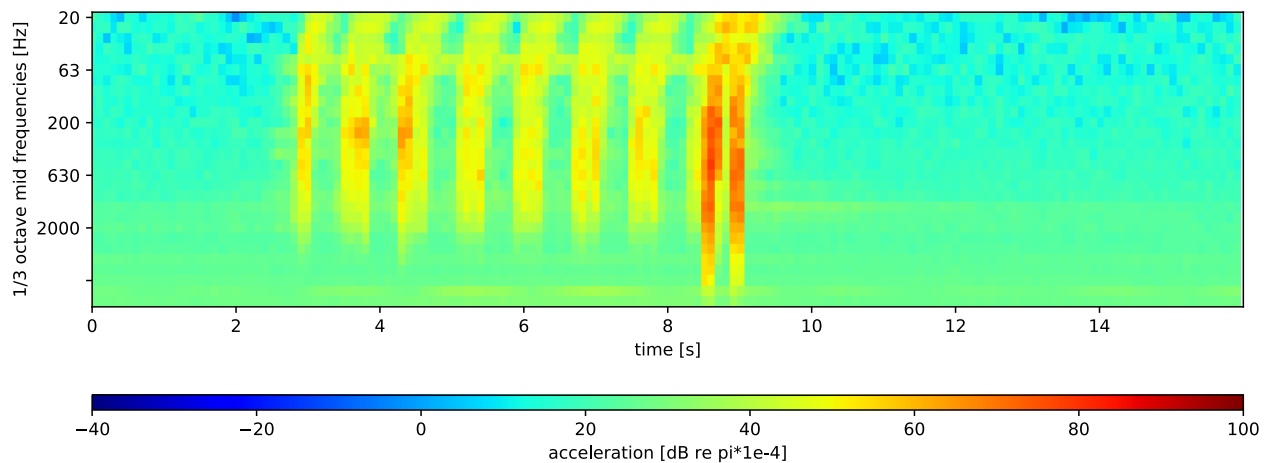
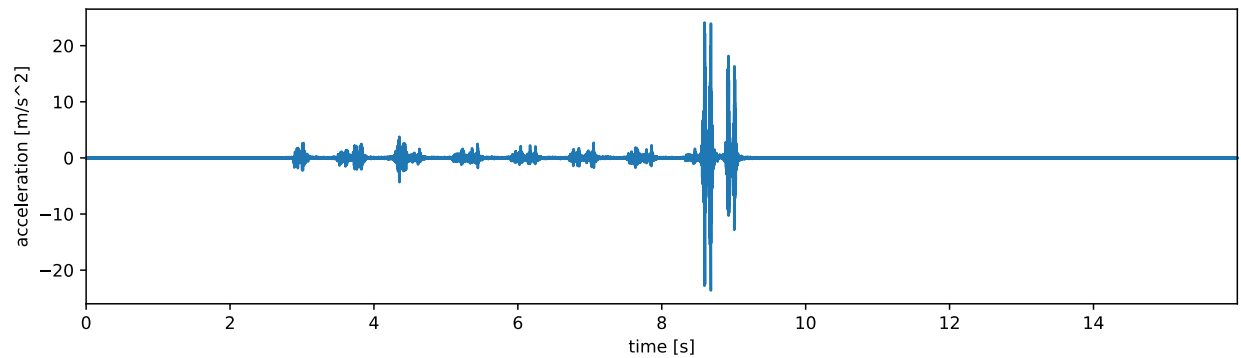


MQ22 / 4rh / MQ22\_230125\_134136+1.h5



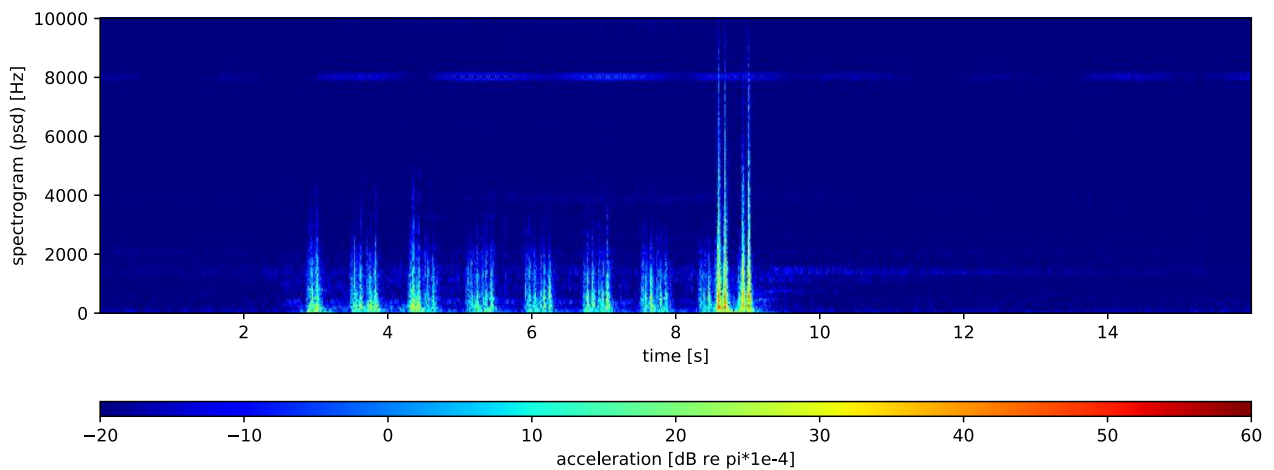
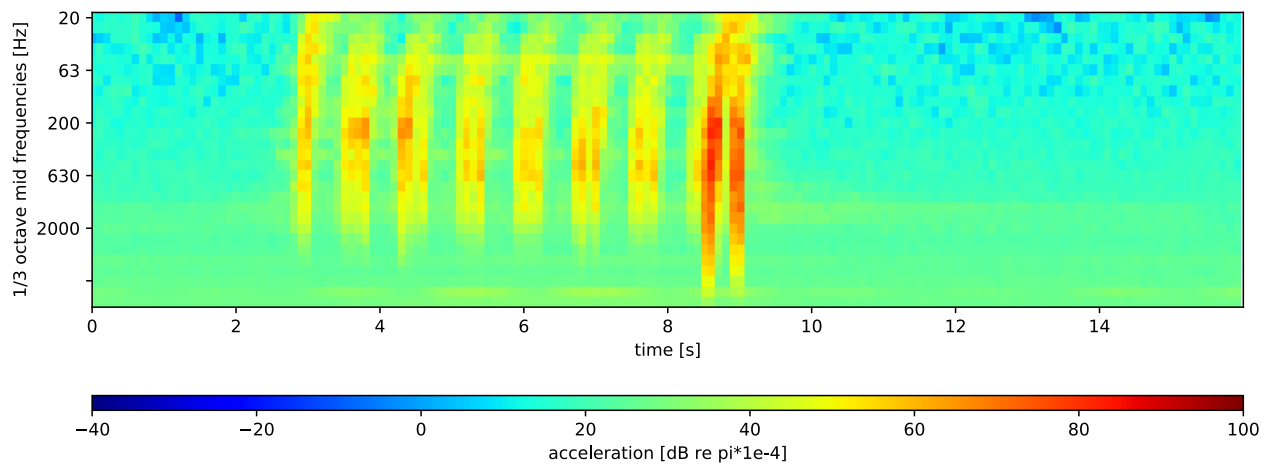
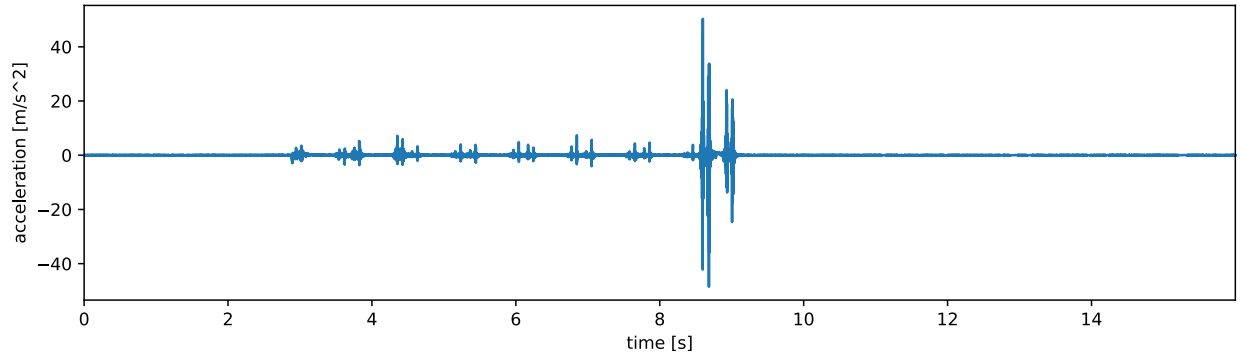
**Acceleration sensors ballast (triaxial)**  
**d = 20 cm below bottom edge of sleeper (5-bl-l)**  
**d = 10 cm below bottom edge of sleeper (5bl-u)**

MQ22 / 5lx / MQ22\_230125\_134136+1.h5

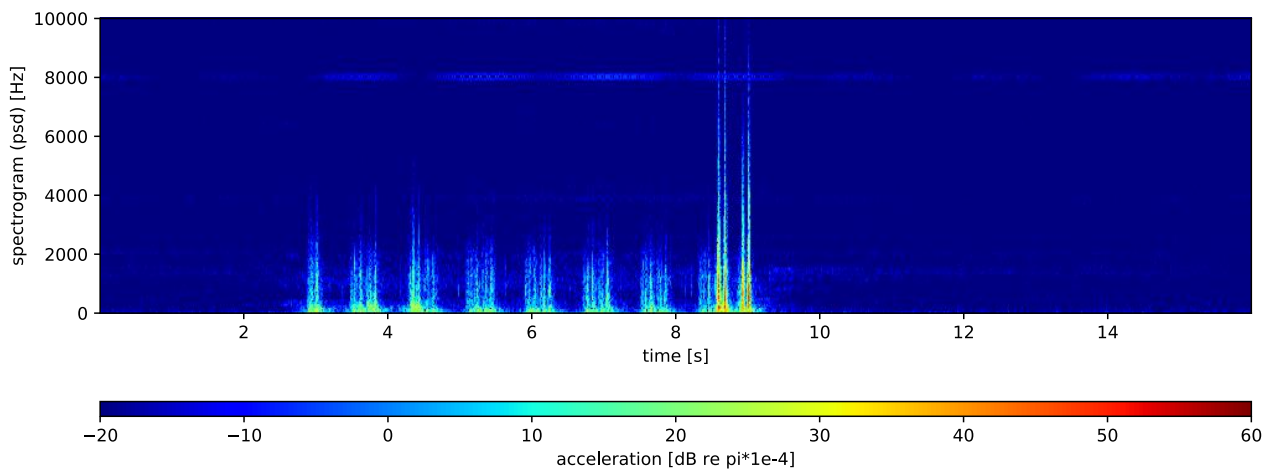
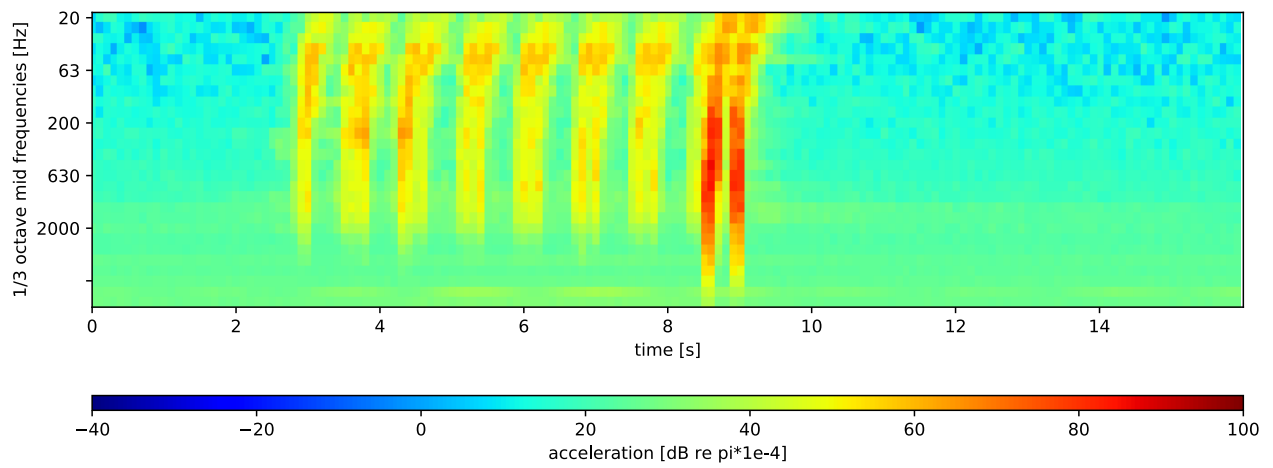
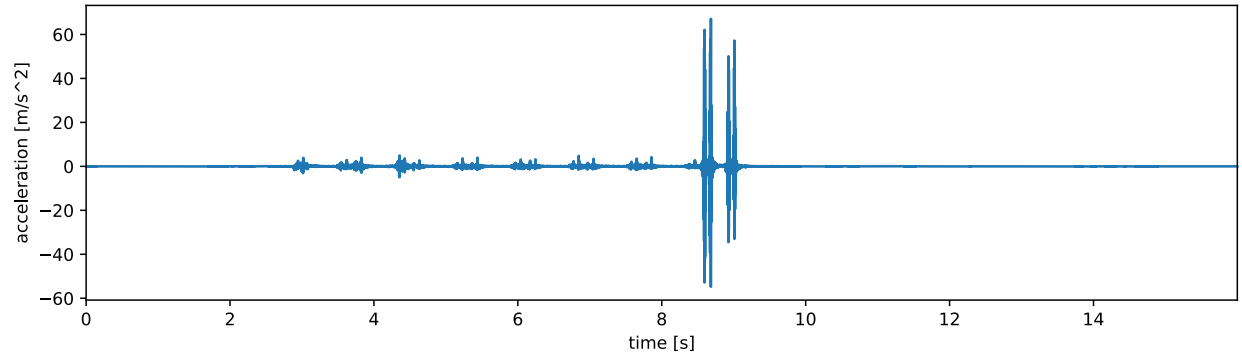




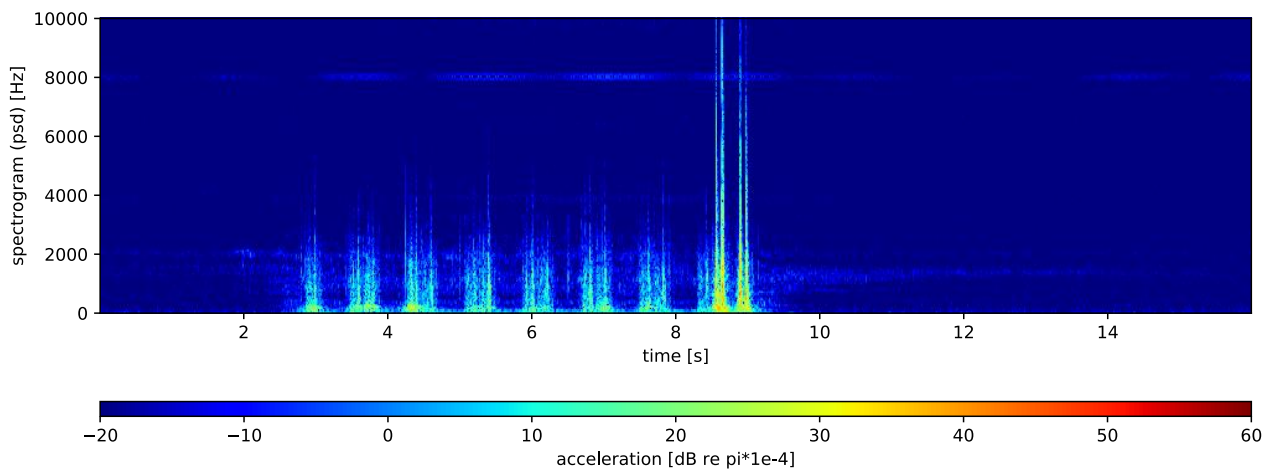
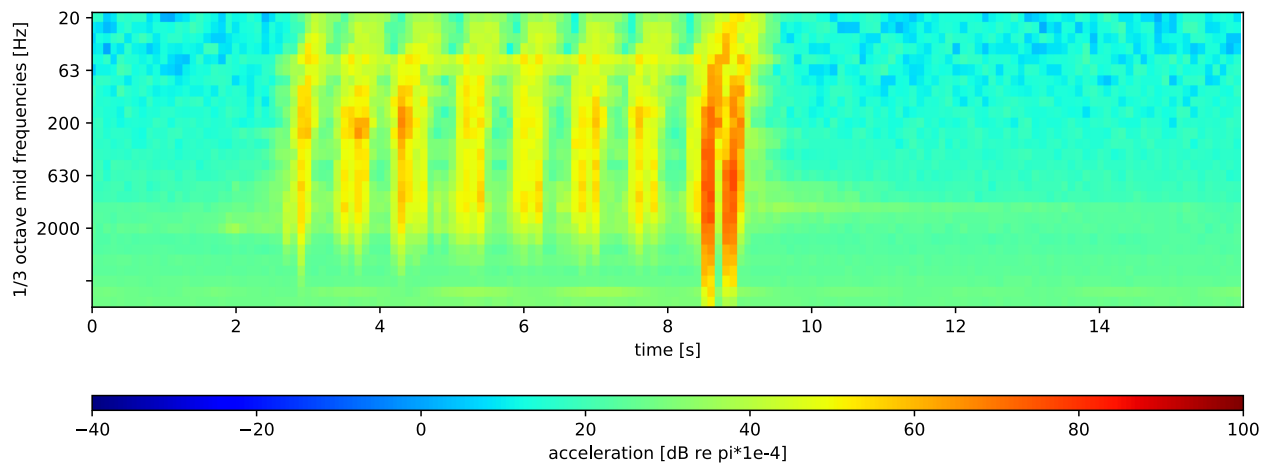
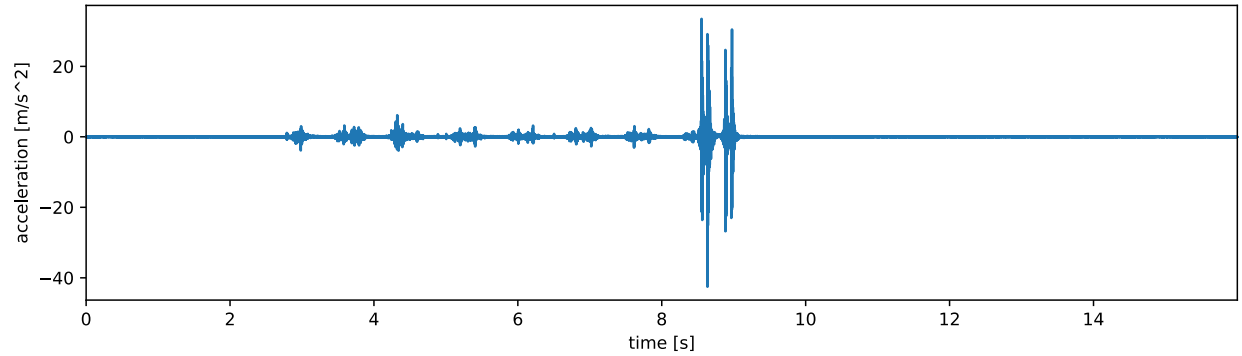
MQ22 / 5ly / MQ22\_230125\_134136+1.h5



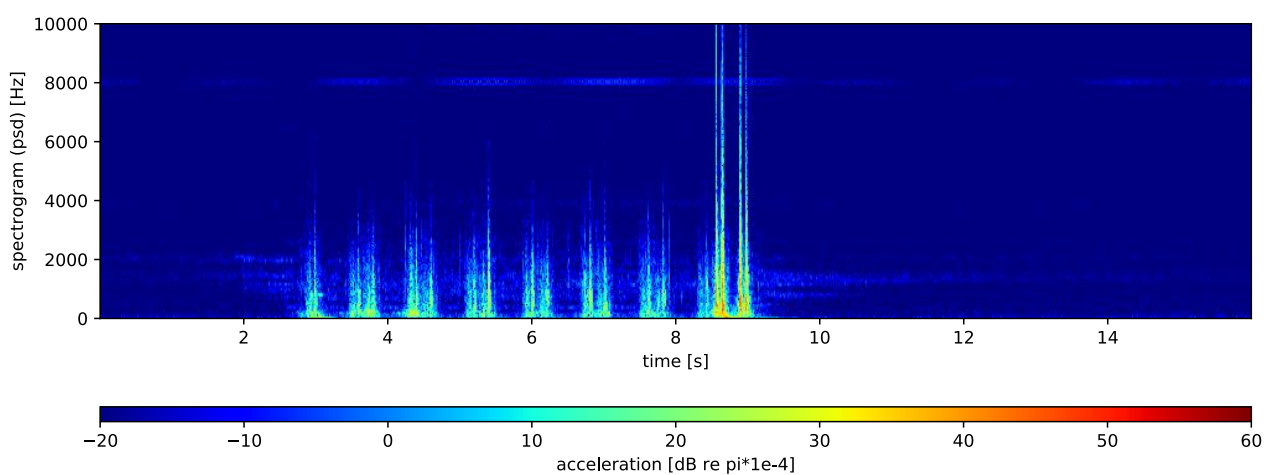
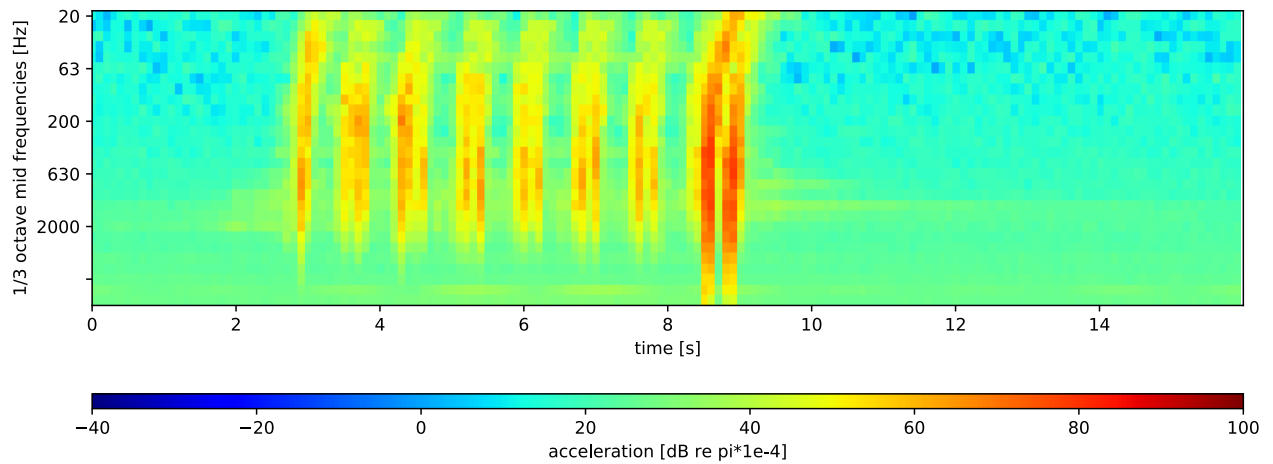
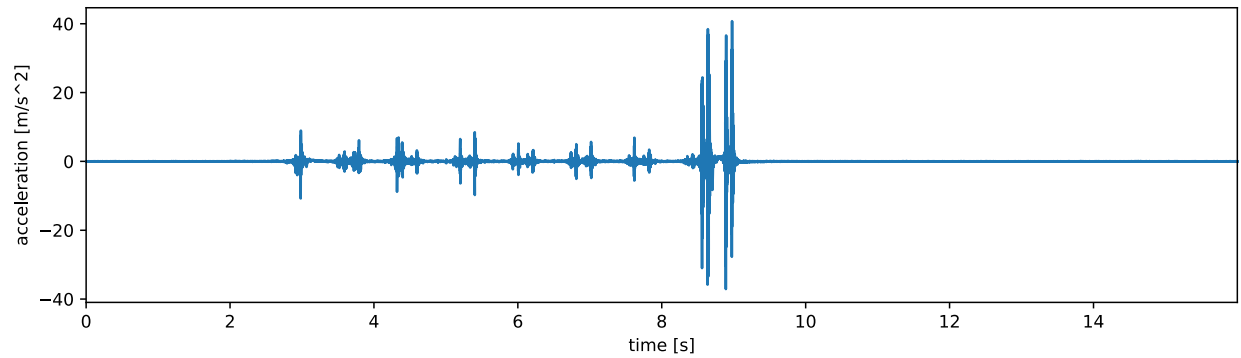
MQ22 / 5lz / MQ22\_230125\_134136+1.h5



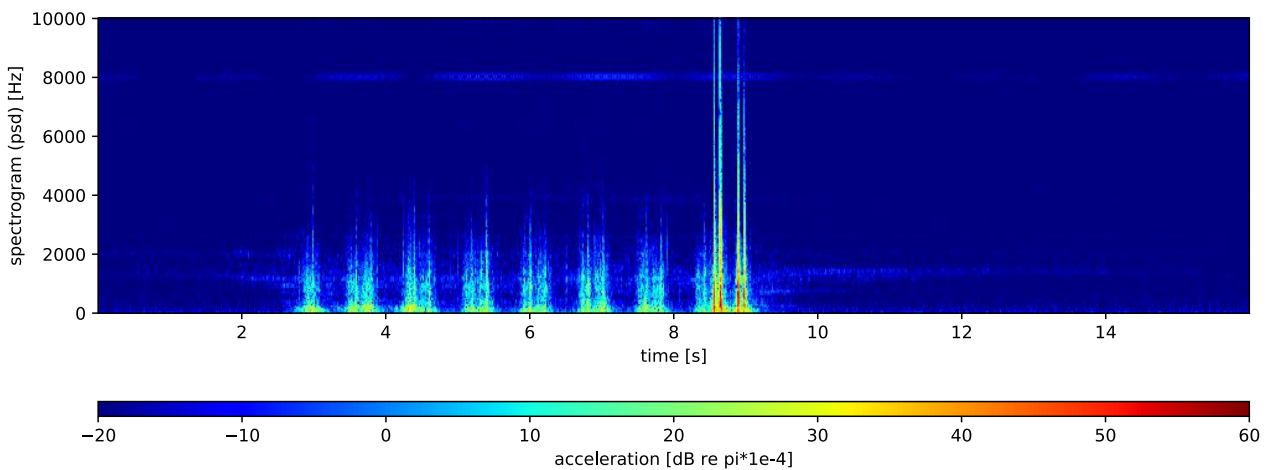
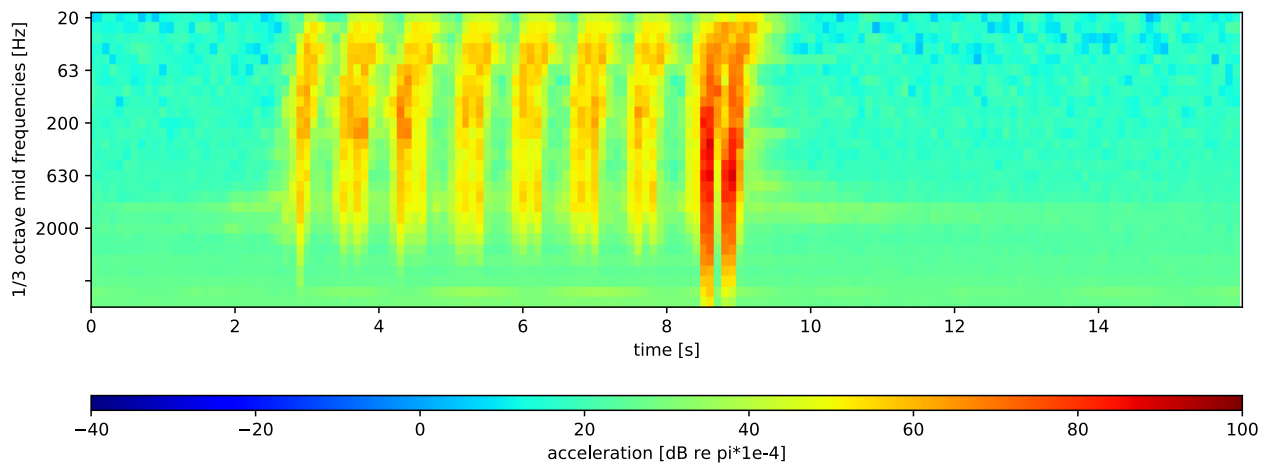
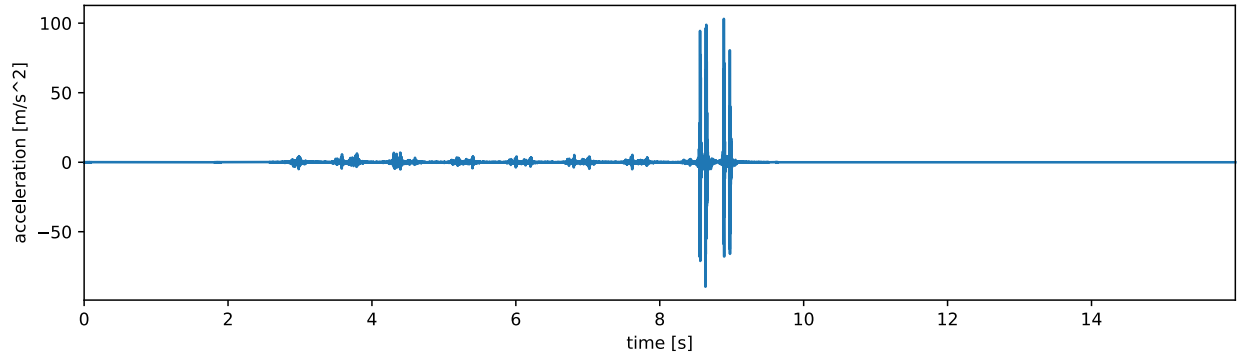
MQ22 / 5ux / MQ22\_230125\_134136+1.h5



MQ22 / 5uy / MQ22\_230125\_134136+1.h5

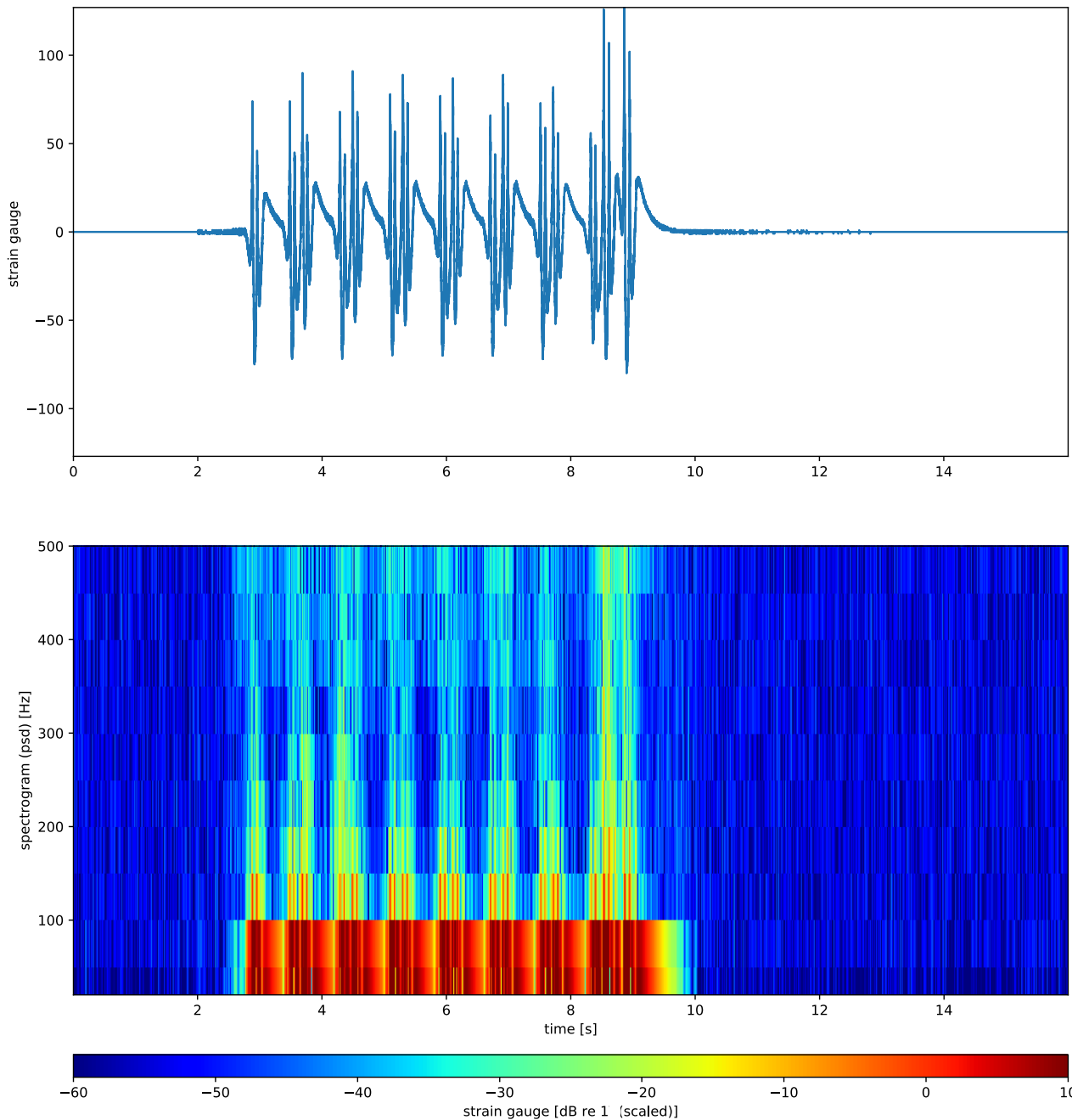


MQ22 / 5uz / MQ22\_230125\_134136+1.h5

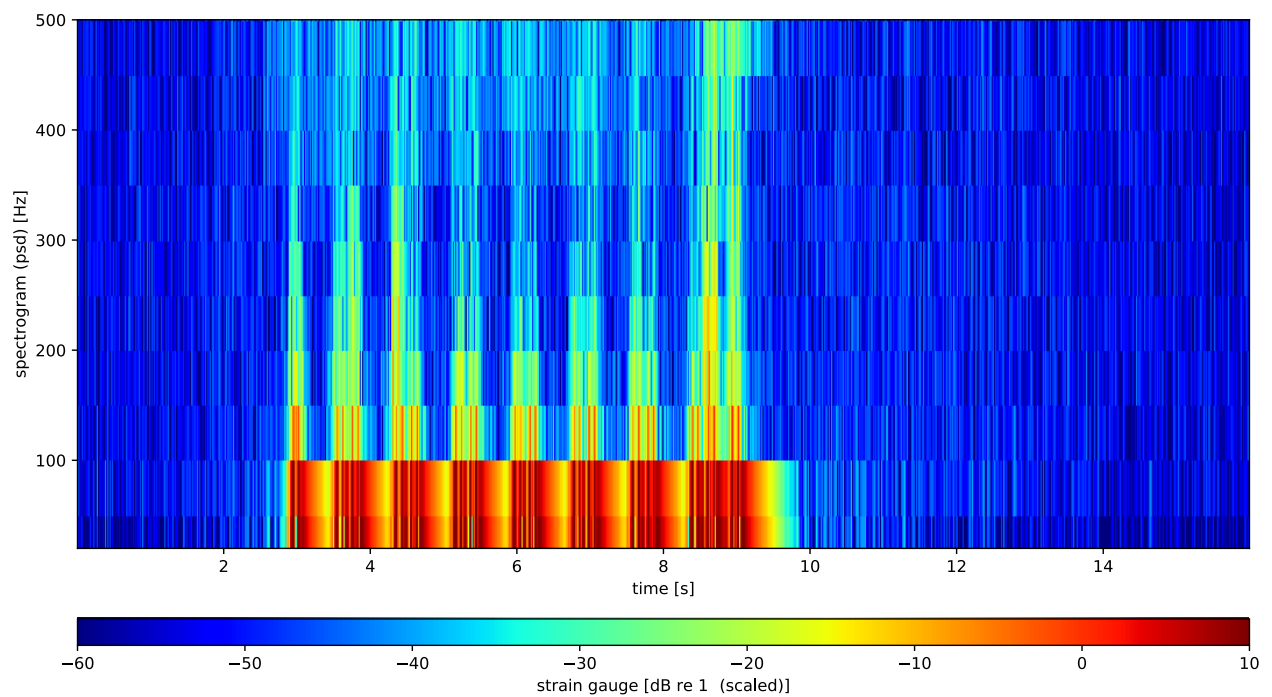
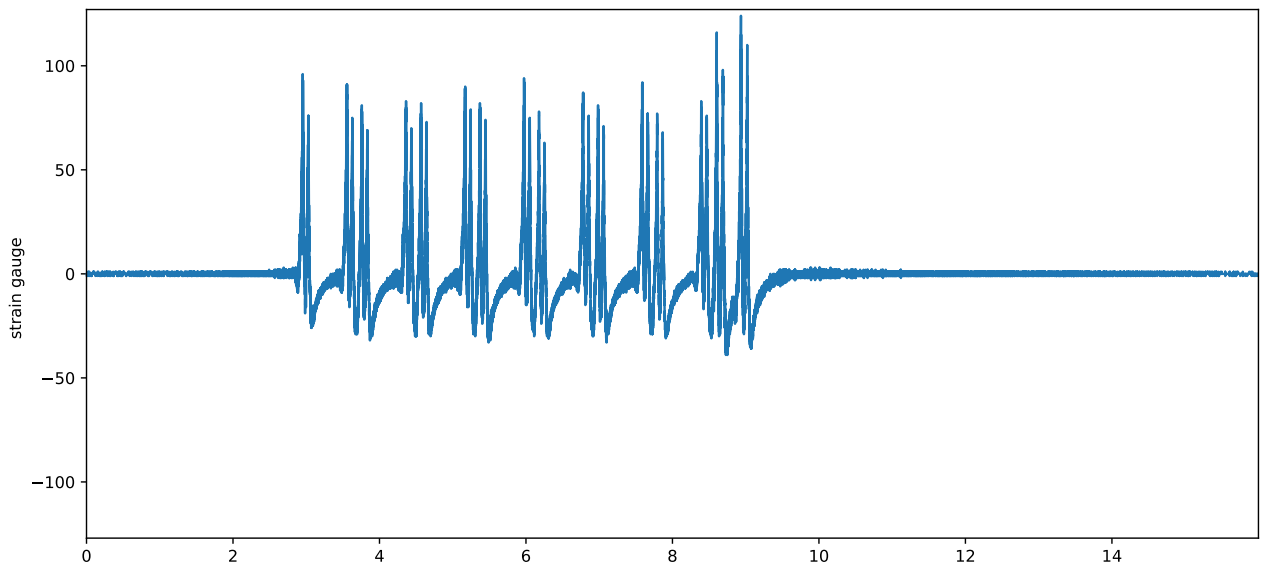


## Axle detector (g1-1I, g1-2I)

MQ22 / g1-1I / MQ22\_230125\_134136+1.h5 / l = 213.0 [m] / v = 129.0 [km/h]

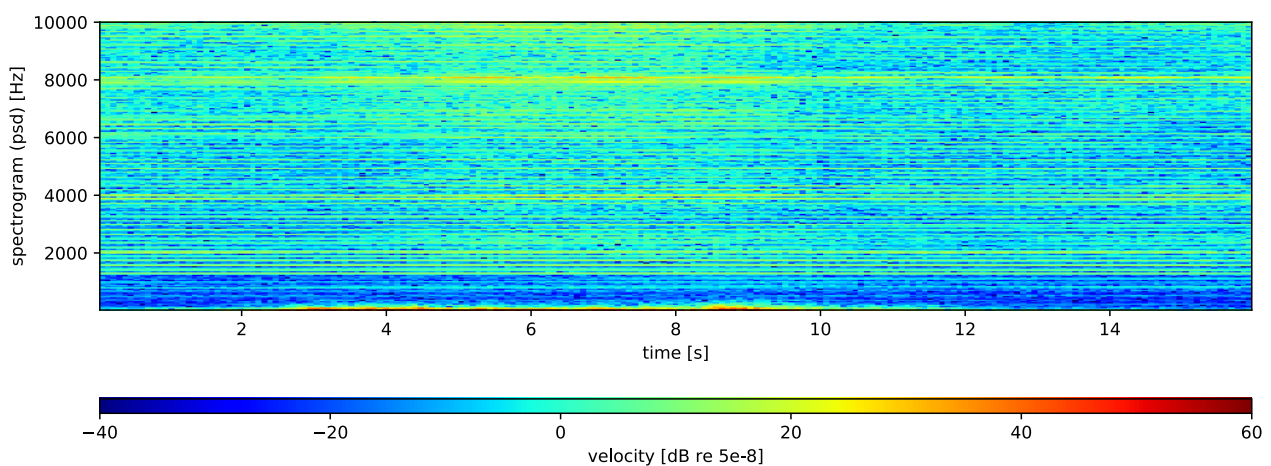
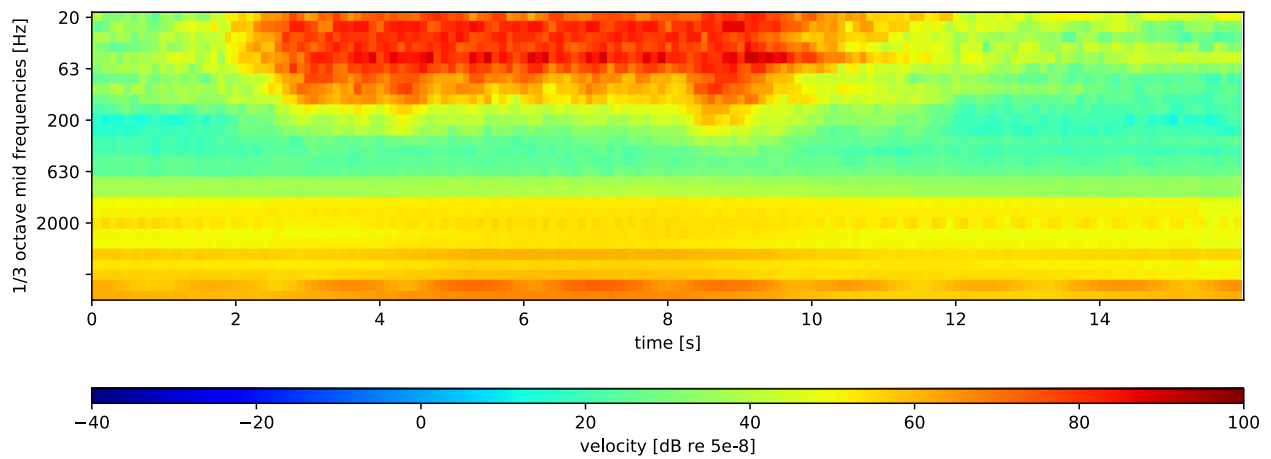
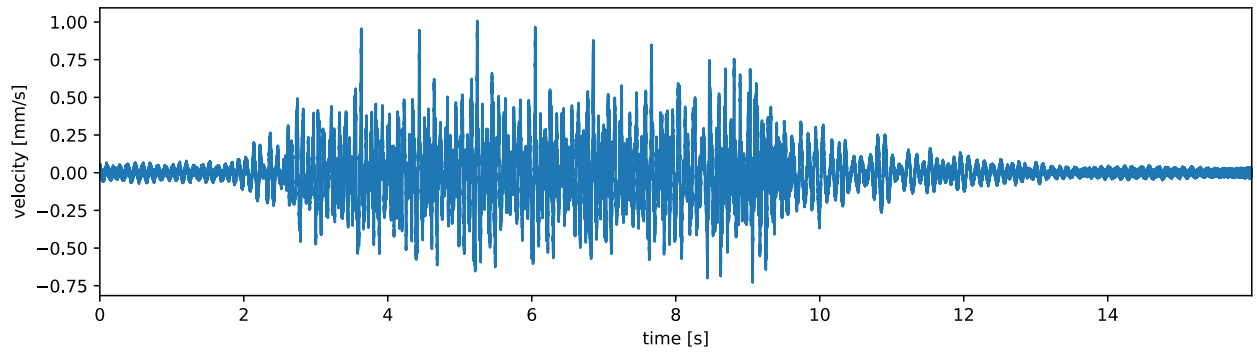


MQ22 / g1-2l / MQ22\_230125\_134136+1.h5 / l = 213.0 [m] / v = 129.0 [km/h]



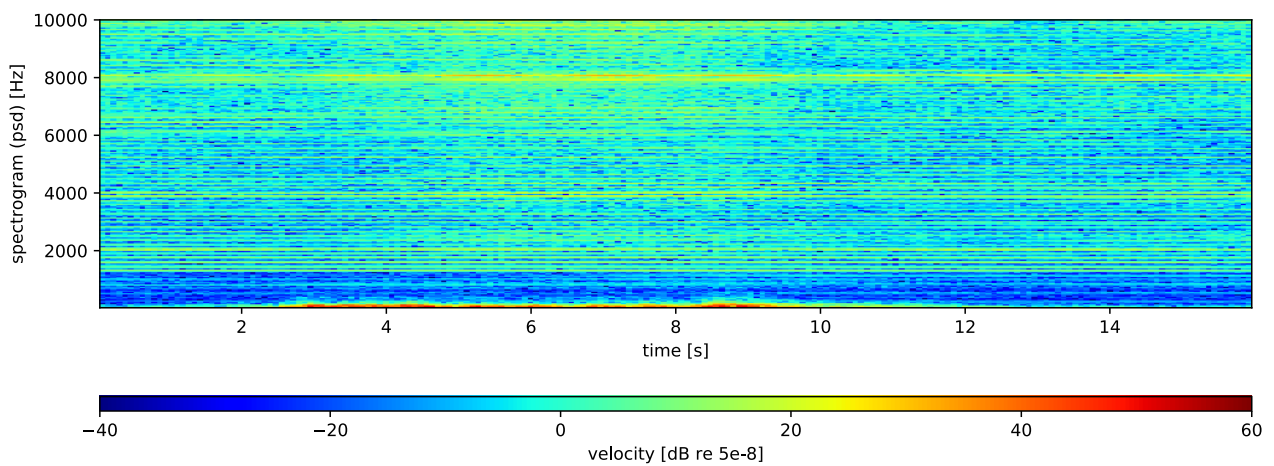
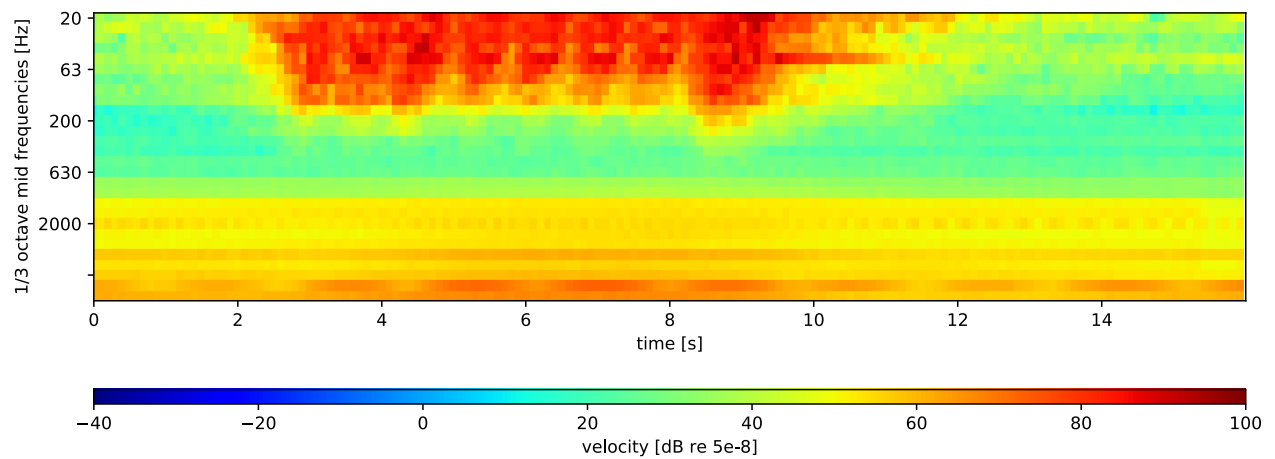
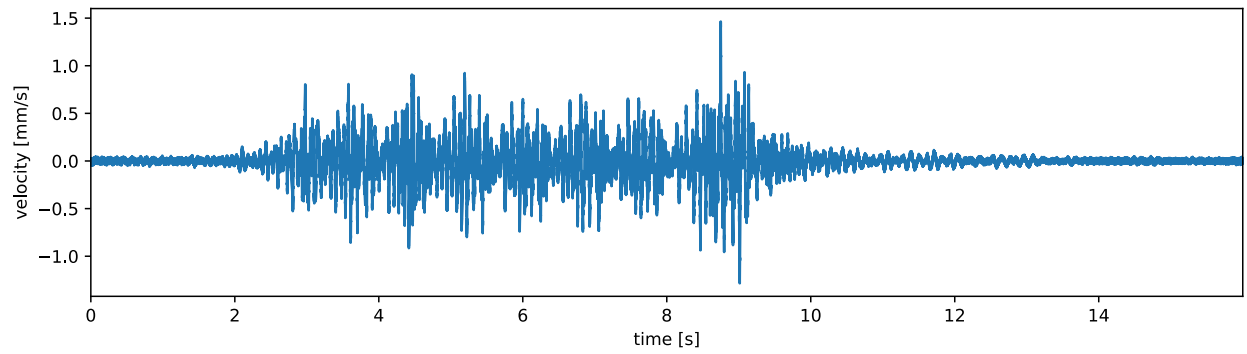
## Soil vibration (triaxial)

MQ22 / vx / MQ22\_230125\_134136+1.h5





MQ22 / vy / MQ22\_230125\_134136+1.h5



MQ22 / vz / MQ22\_230125\_134136+1.h5

