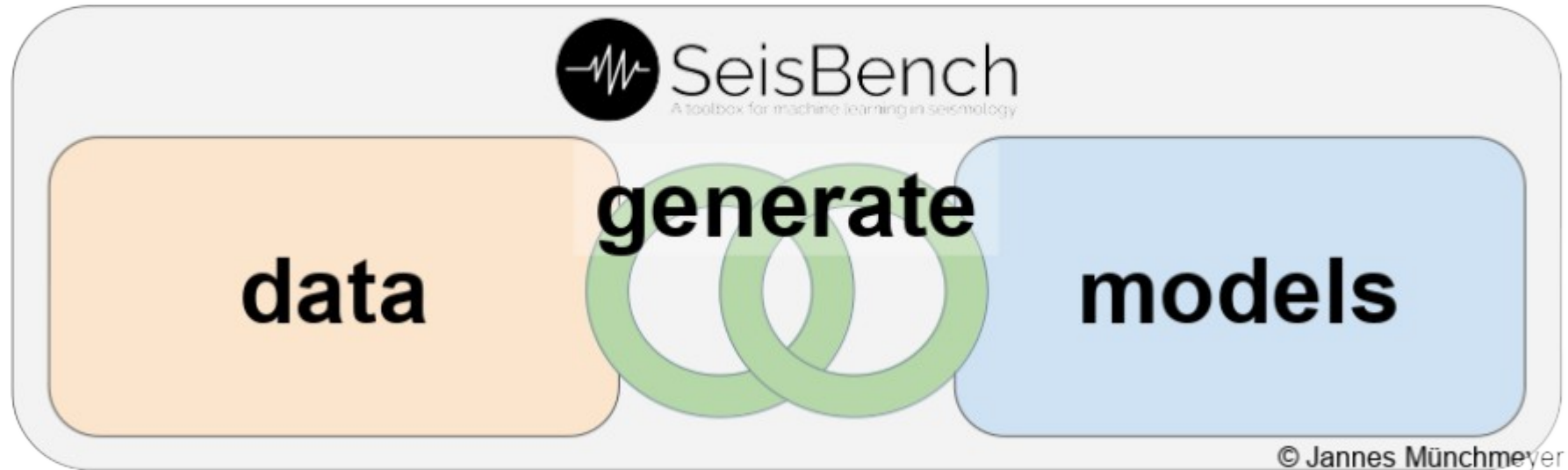


dbMiss – update RUB 2025

- New environment for the DenoisingAutoEncoder (DAE) in SeisBench
- Dataset KWISS – testing the Denoising AutoEncoder – Up to what distance can the denoiser suppress wind noise and enable phase determination?

The SeisBench framework

SeisBench is an open-source Python framework for machine learning in seismology, consisting of three main modules.

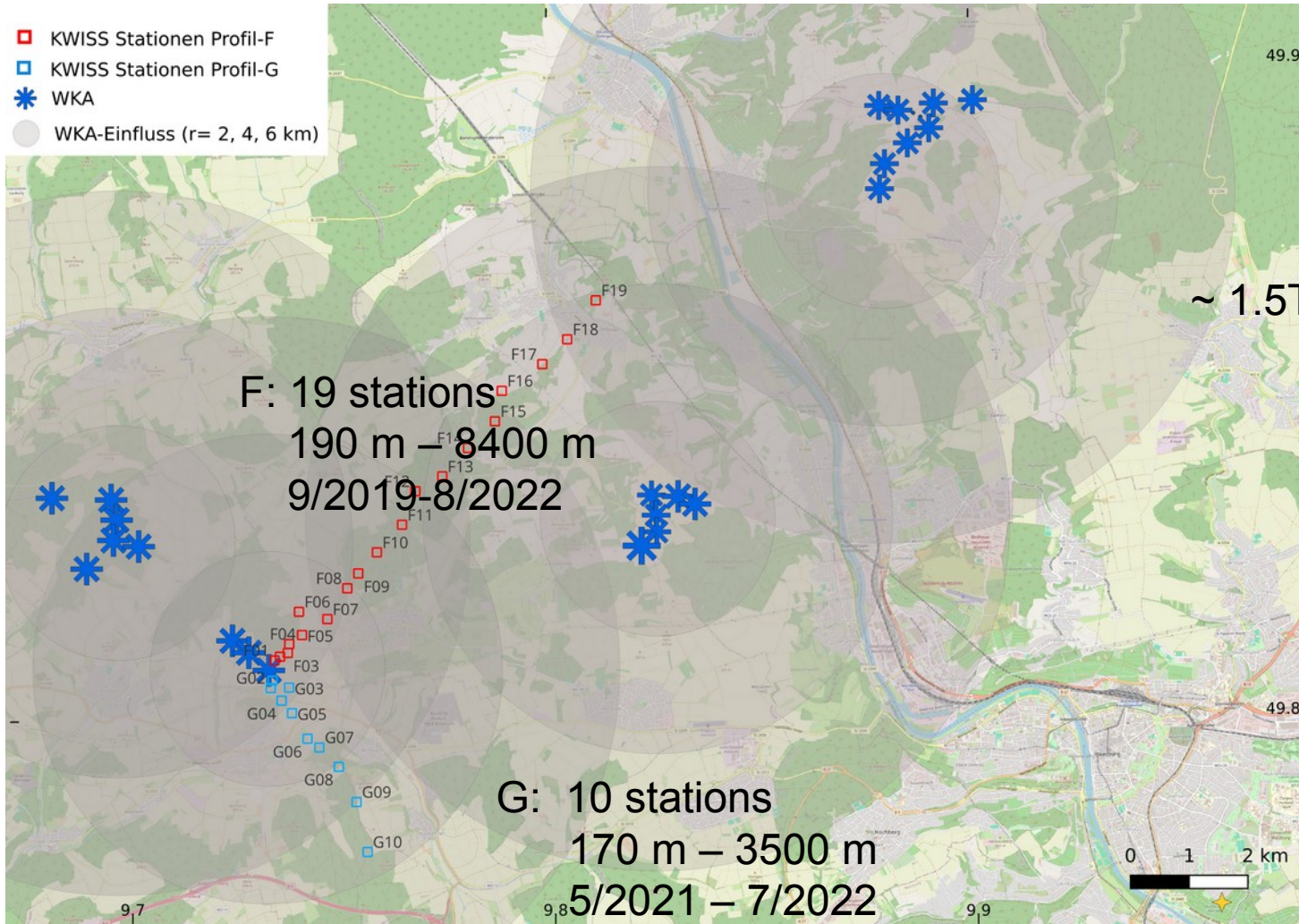


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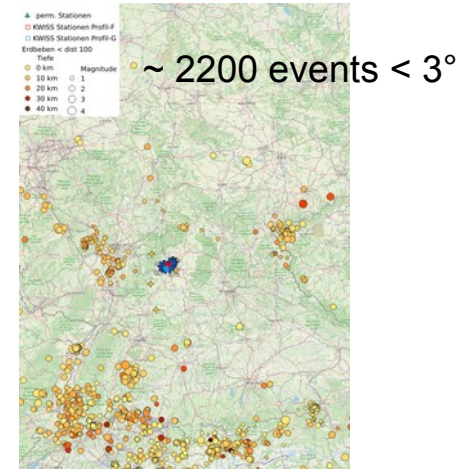
KWISS - data set

- KWISS Stationen Profil-F
- KWISS Stationen Profil-G
- ★ WKA
- WKA-Einfluss ($r = 2, 4, 6$ km)



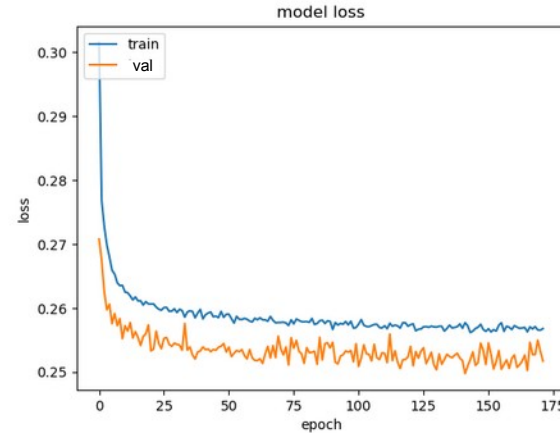
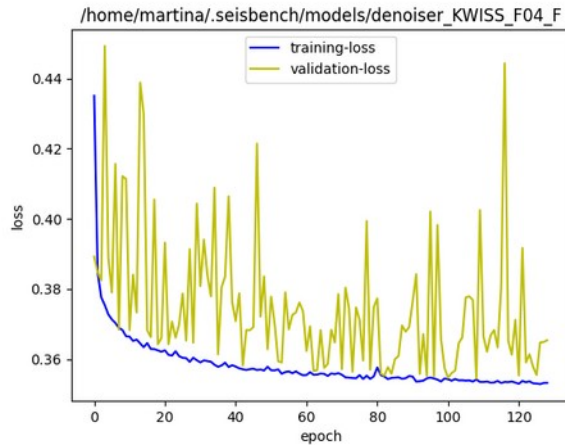
- Wind farms in different distances to the profiles
- Long observation period (F 3y, G 1y)

~ 1.5TB continuous waveform data

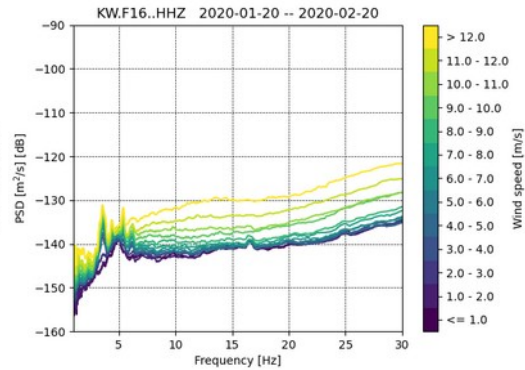
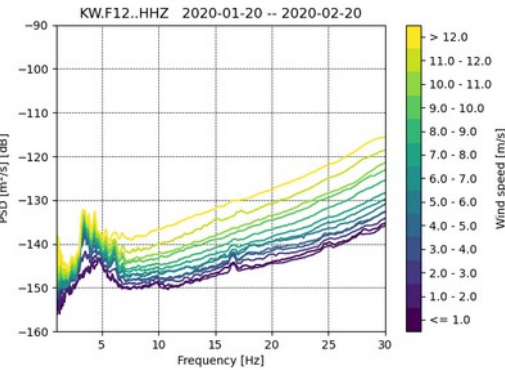
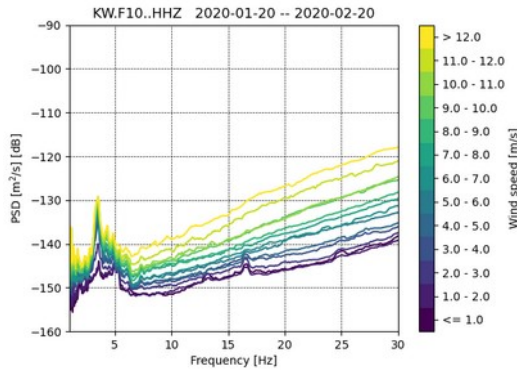
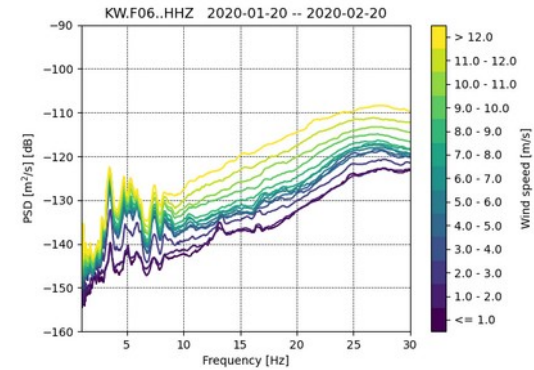
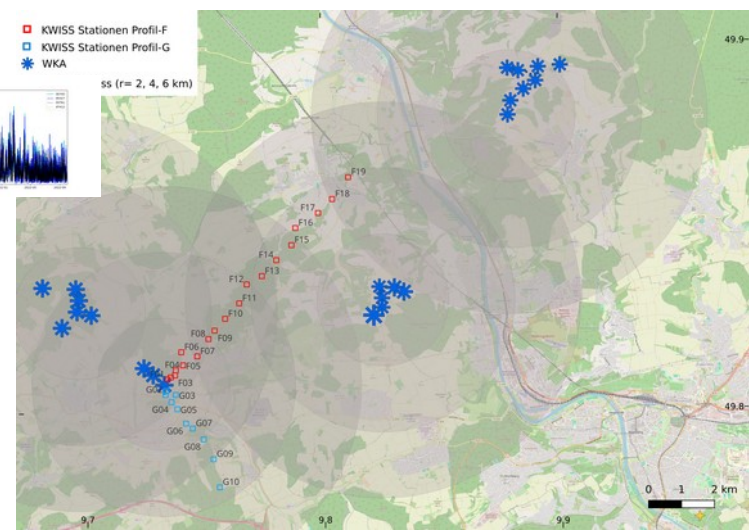
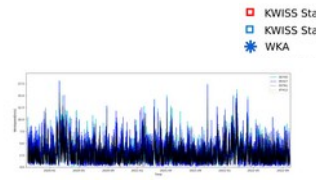
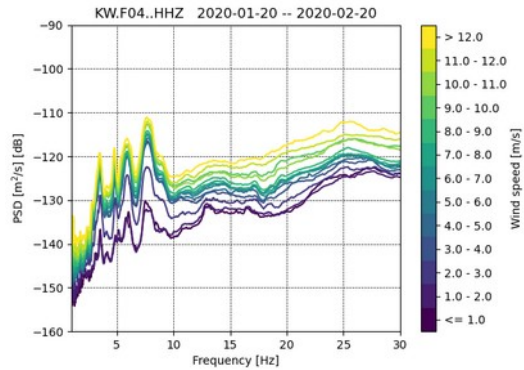
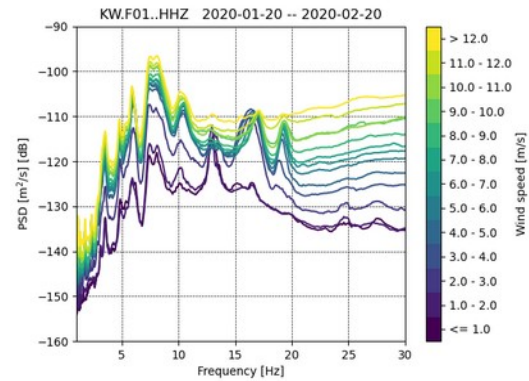


Seismic radiation from wind turbines:
observations and analytical modeling of
frequency-dependent amplitude decays
Fabian Limberger, Michael Lindenfeld, Hagen
Deckert, and Georg Rümpler

- Problems with loss reduction of validation data during training of models
- Test of various model parameters
- Comparison with original SeismicDenoiser



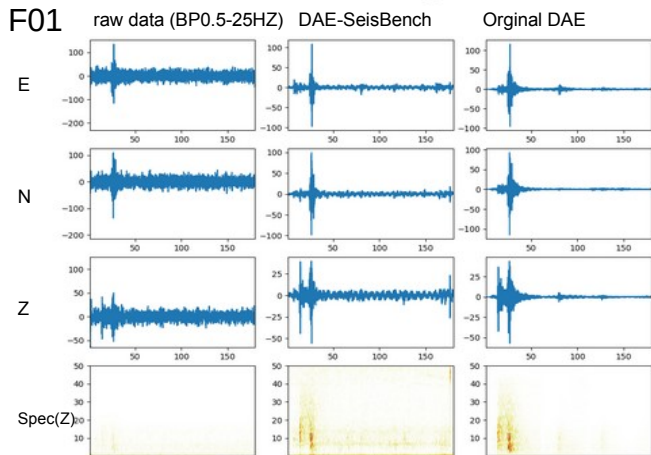
KWISS – winddependency



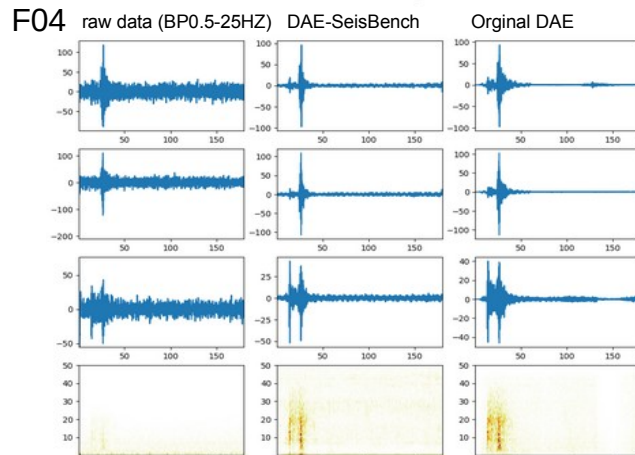
KWISS – denoised Data

Wind 1.6 m/s distance 92 km mag=0.7

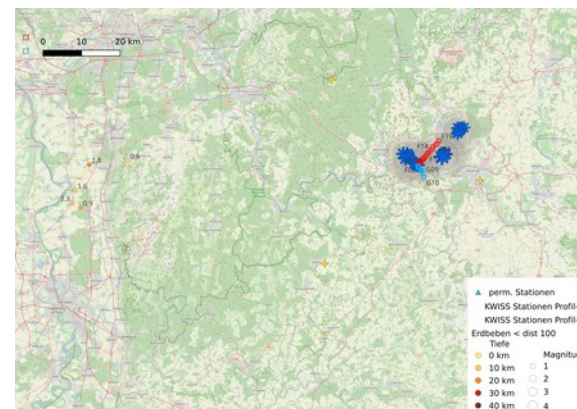
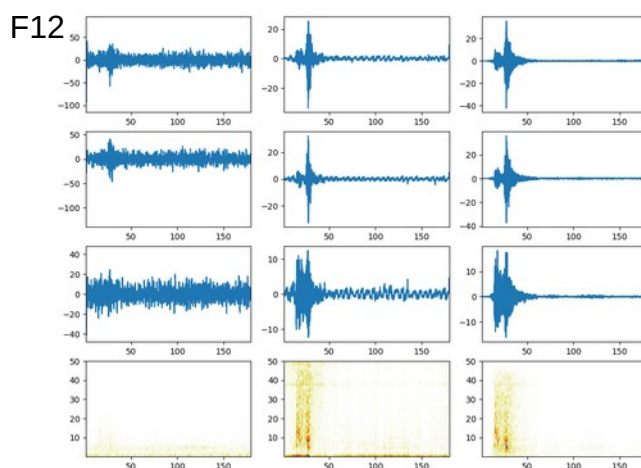
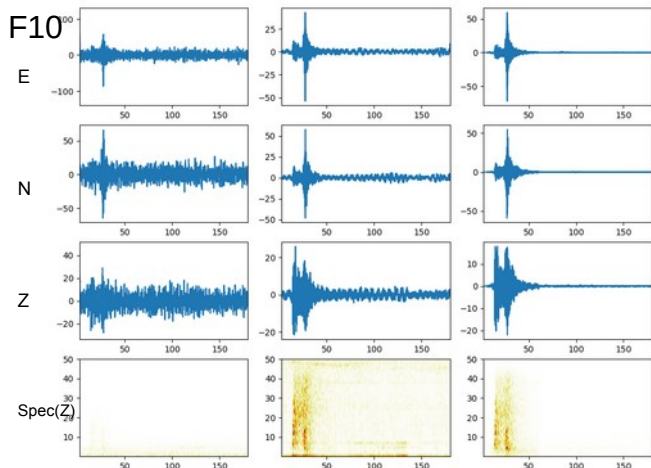
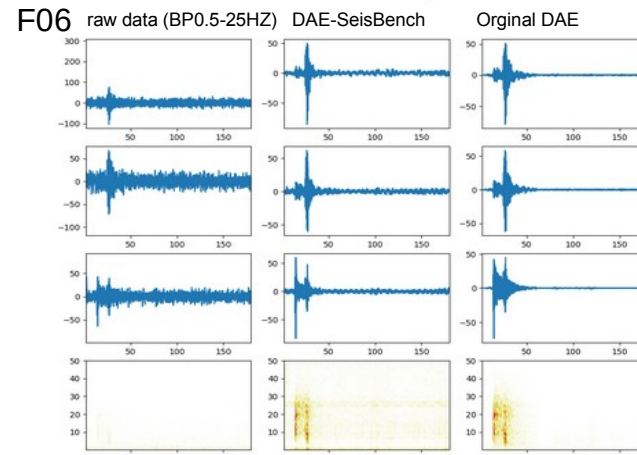
2020-04-06T23:43:23.400000Z wind:1.6 dist:92 mag:0.7 sbmodel:F stat:F01



2020-04-06T23:43:23.400000Z wind:1.6 dist:92 mag:0.7 sbmodel:F stat:F04



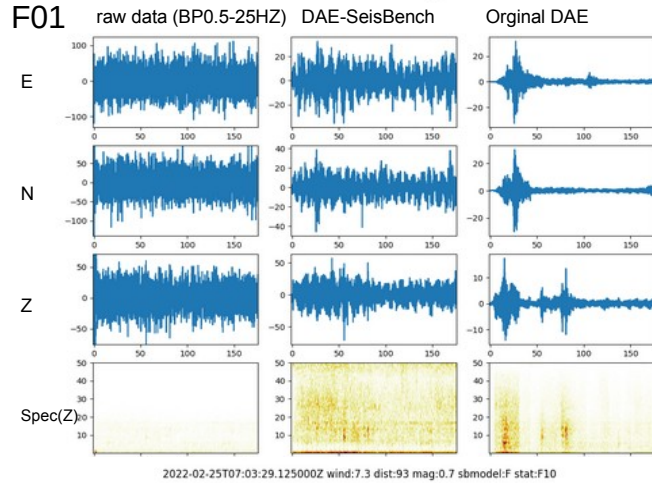
2020-04-06T23:43:23.400000Z wind:1.6 dist:92 mag:0.7 sbmodel:F stat:F06



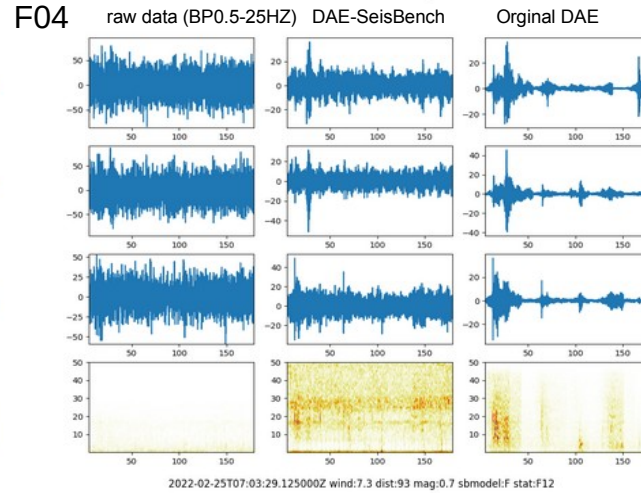
KWISS – denoised Data

Wind 7.3 m/s distance 93 km mag=0.7

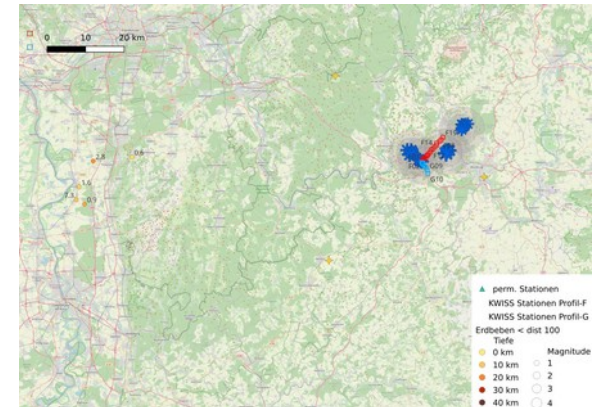
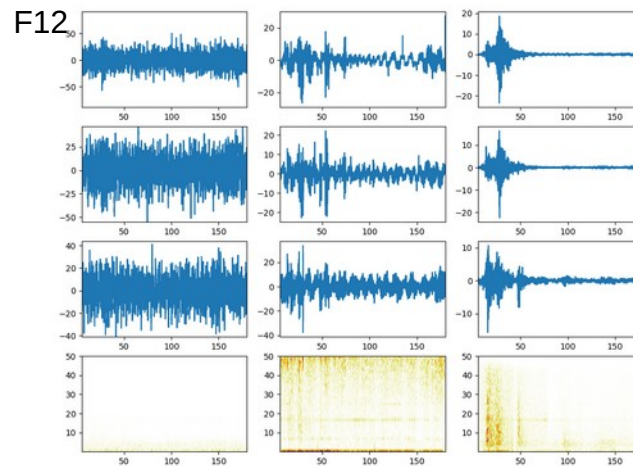
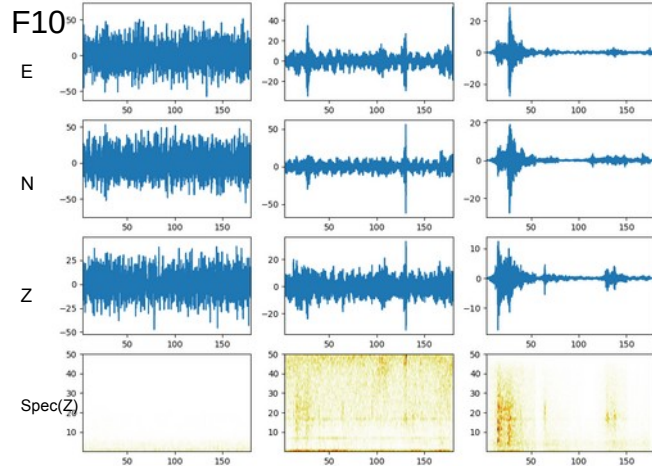
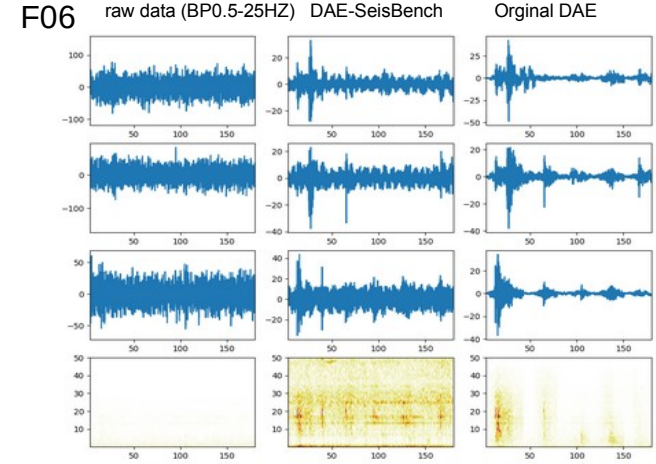
2022-02-25T07:03:29.125000Z wind:7.3 dist:93 mag:0.7 sbmodel:F stat:F01



2022-02-25T07:03:29.125000Z wind:7.3 dist:93 mag:0.7 sbmodel:F stat:F04



2022-02-25T07:03:29.125000Z wind:7.3 dist:93 mag:0.7 sbmodel:F stat:F06

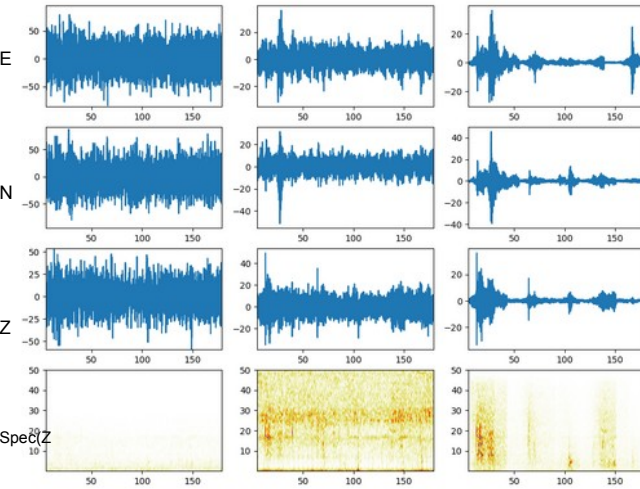


KWISS – denoised Data

Wind 7.3 m/s distance 93 km mag=0.7 station F04

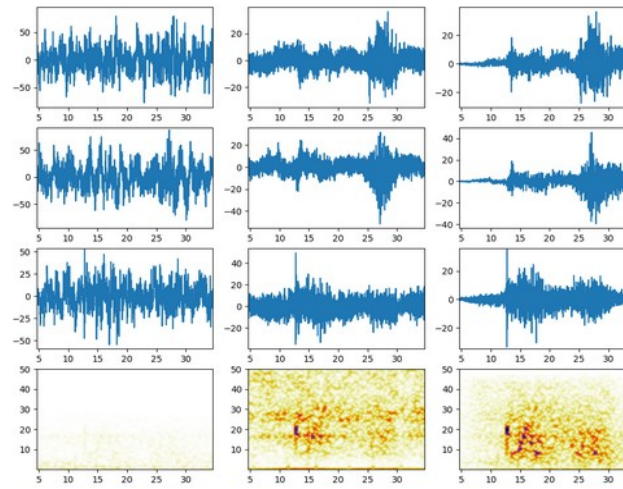
2022-02-25T07:03:29.125000Z wind:7.3 dist:93 mag:0.7 sbmodel:F stat:F04

raw data (BP0.5-25HZ) DAE-SeisBench Original DAE



2022-02-25T07:03:29.125000Z wind:7.3 dist:93 mag:0.7 sbmodel:F stat:F04

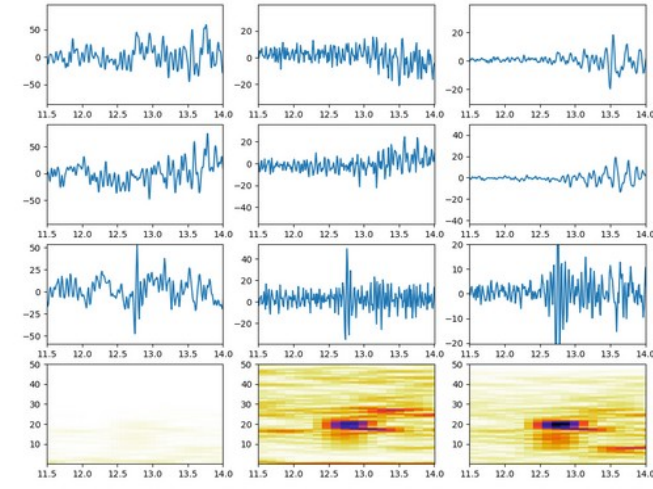
raw data (BP0.5-25HZ) DAE-SeisBench Original DAE



zoom to event

2022-02-25T07:03:29.125000Z wind:7.3 dist:93 mag:0.7 sbmodel:F stat:F04

raw data (BP0.5-25HZ) DAE-SeisBench Original DAE



zoom to P onset