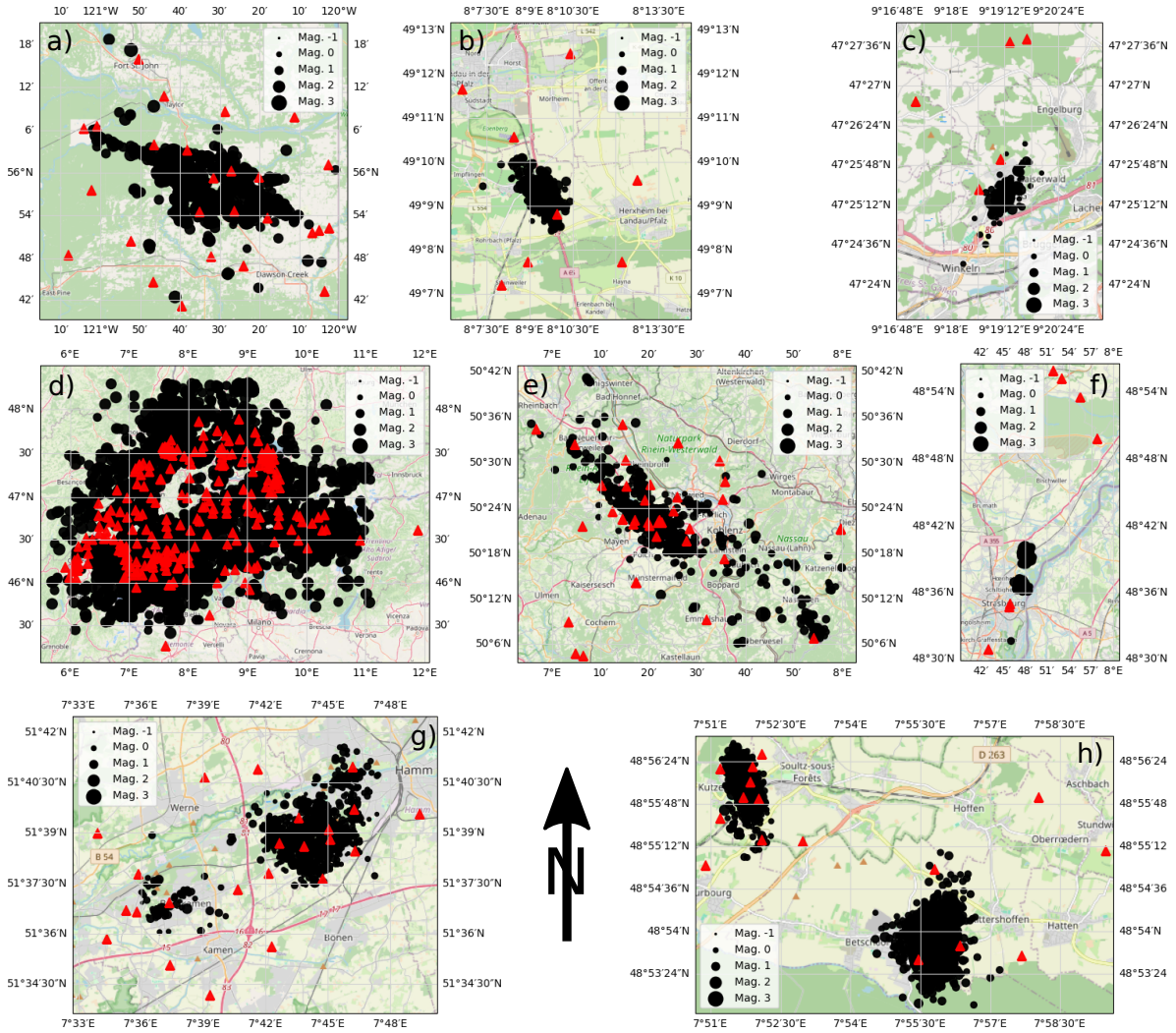


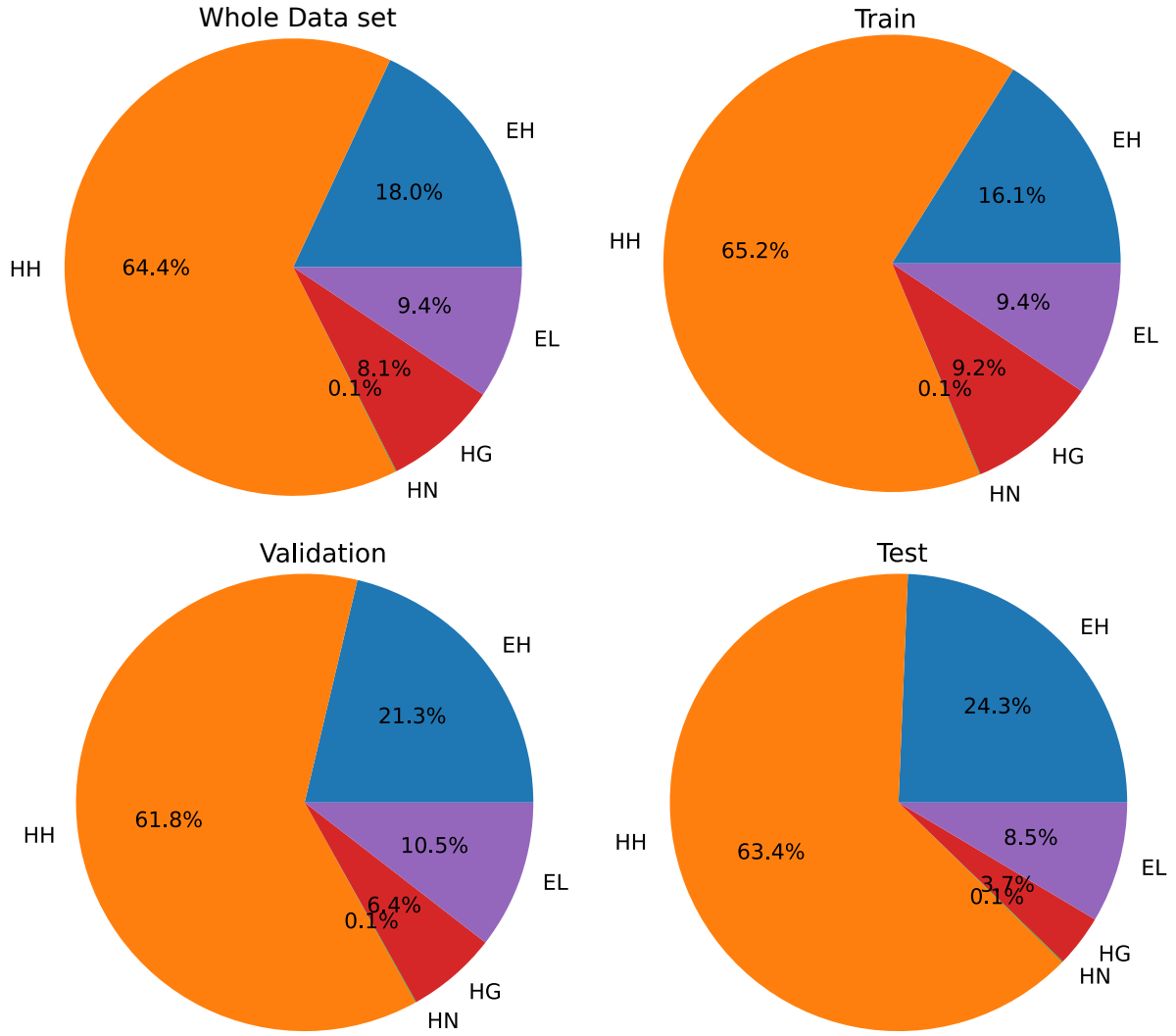
Supplementary material for Picking Induced Seismicity with Deep Learning (piSDL)

Janis Heuel, Vincent Maurer, Michael Frietsch, Andreas Rietbrock

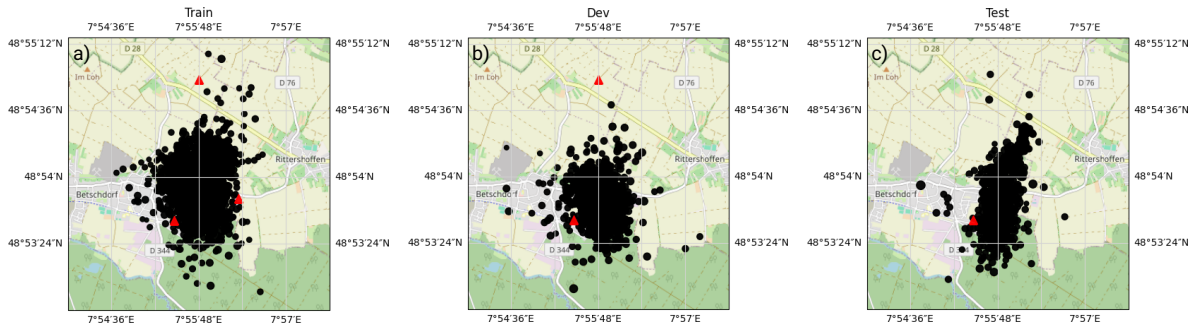
The supplementary material contains Figures showing details about the the event and station distribution of each single data set, pie diagrams of the channels for training, validation and testing, details about the number of picks, a map where we compare the earthquake locations from different seismicity catalogues in Rittershoffen, and more waveform examples from Rittershoffen. The waveform examples containing all three components and it compares the piSDL1 model against the original published PhaseNet model.



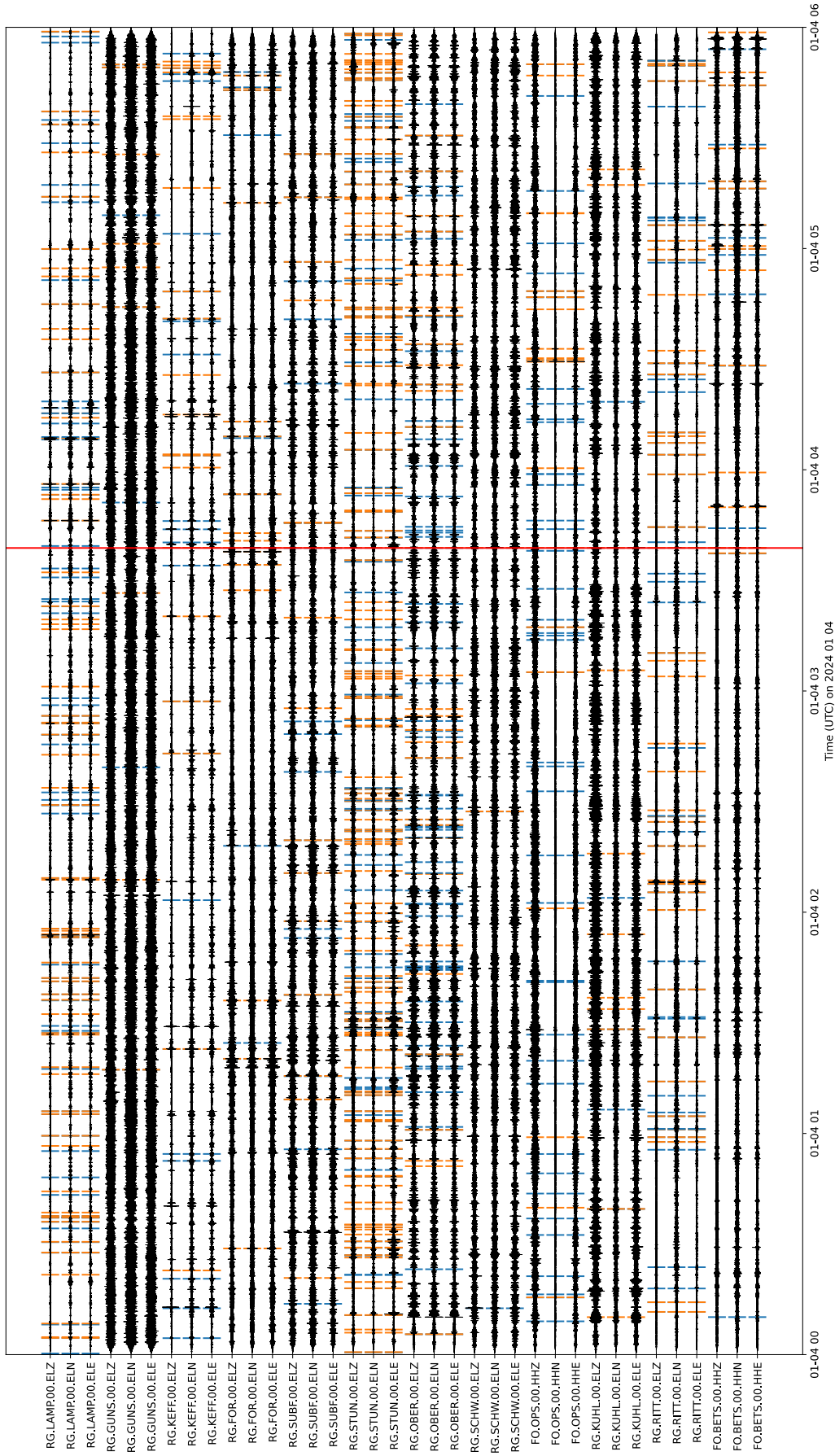
S 1: Map with all earthquakes and most stations from the gathered data sets. (a) Dawson-Septimus area in Canada, (b) Insheim, (c) St. Gallen, (d) all events from the Swiss Seismological Service with $M_L \leq 2$ between 2009 and 2023, (e) Eifel, (f) Vendenheim, (g) Ruhr area, and (h) Soultz-sous-Forêts and Rittershoffen.



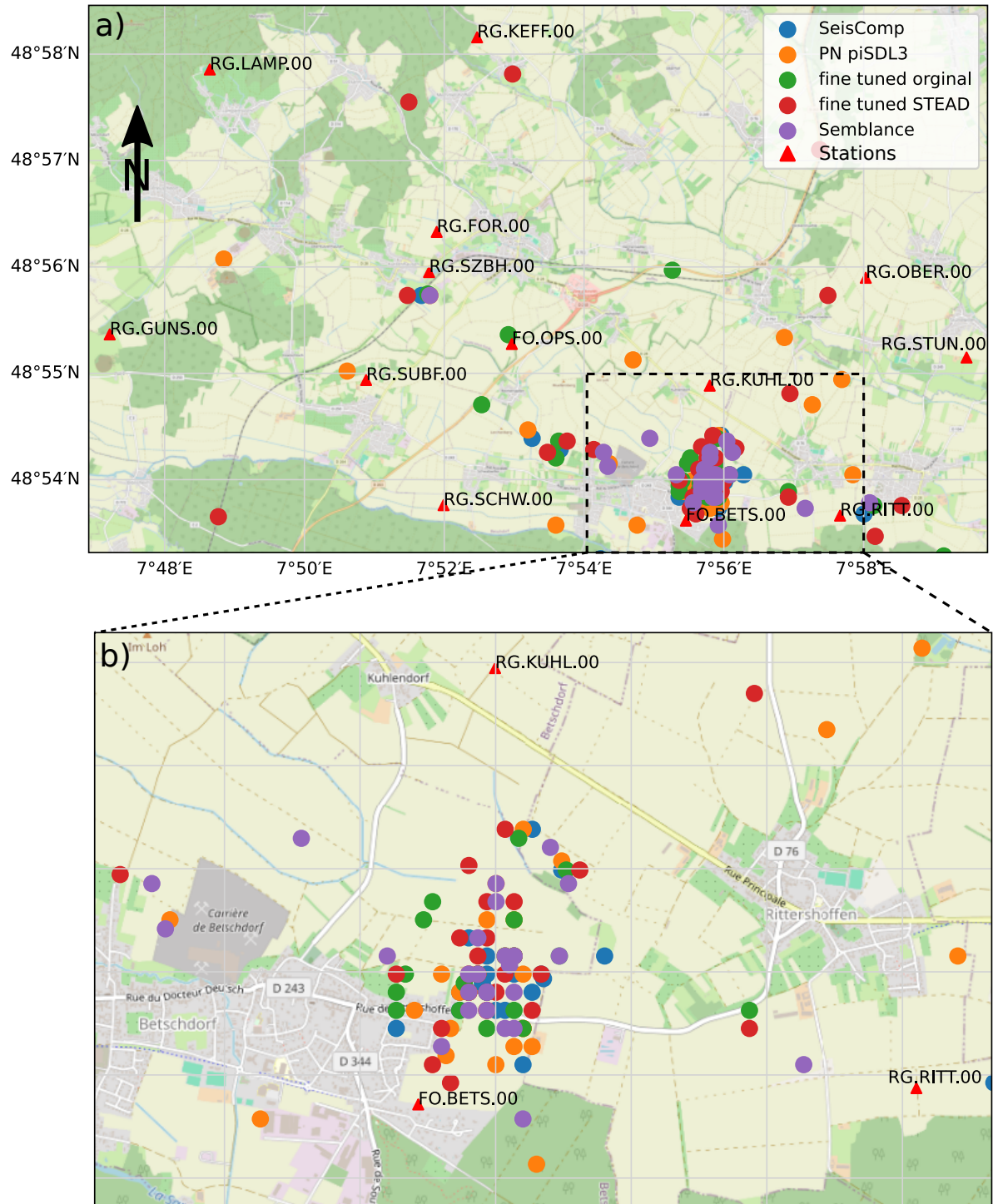
S 2: Pie diagram for channel naming for the whole data set and the splits for training (70%), validation (20%), and testing (10%).



S 3: Map of earthquakes from Rittershoffen used for training (a), validation (b) and testing (c), among the other data sets that were split in the same way.



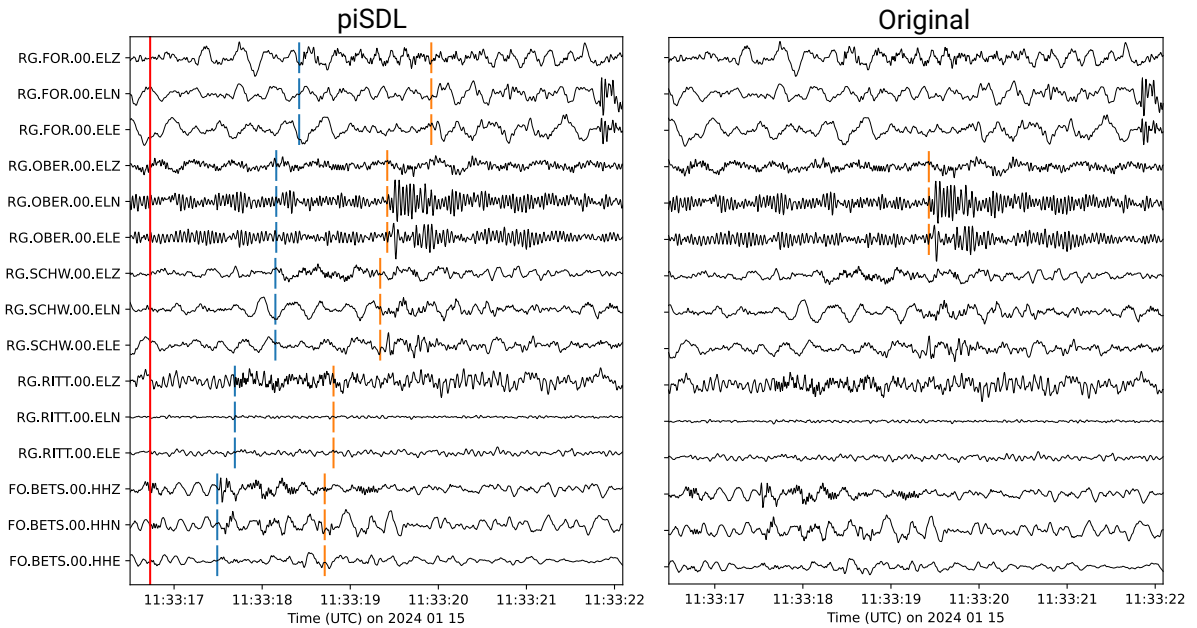
S 4: Example of detected picks in six hours of continuous data. In total 1344 P- and 1134 S-arrivals (blue and orange lines) were predicted by model PN piSDL01. The vertical red line represents the origin time of an associated event.



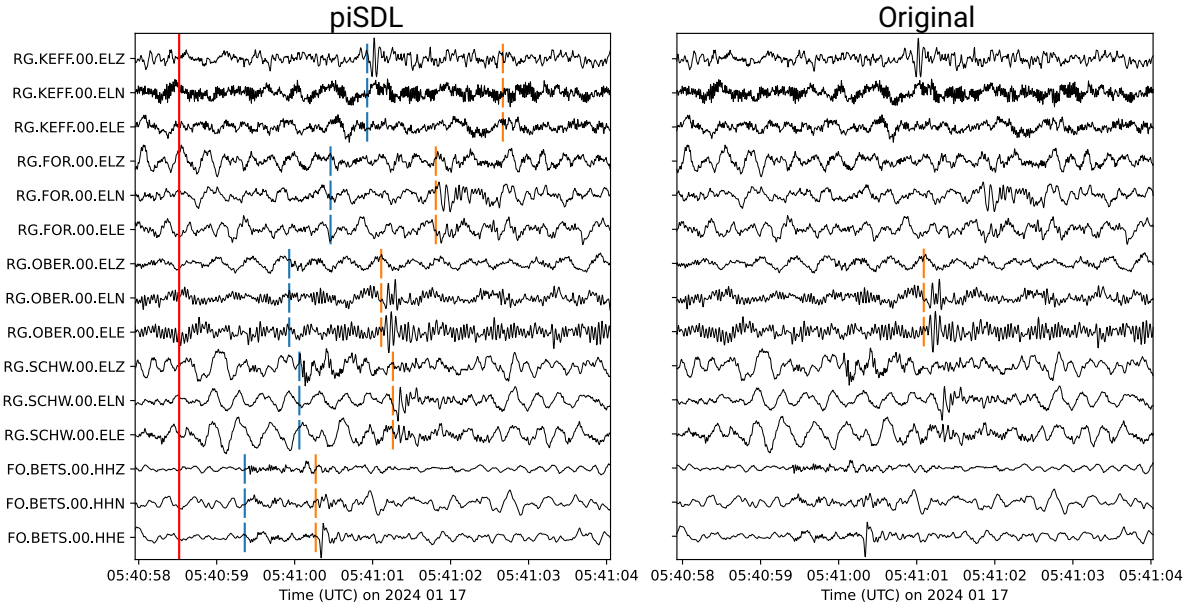
S 5: Map of site in Rittershoffen with stations and different detected earthquakes from various models (a) and zoomed in view (b).

T 1: Number of predicted picks for each station using model PN piSDL1 for one month of continuous data.

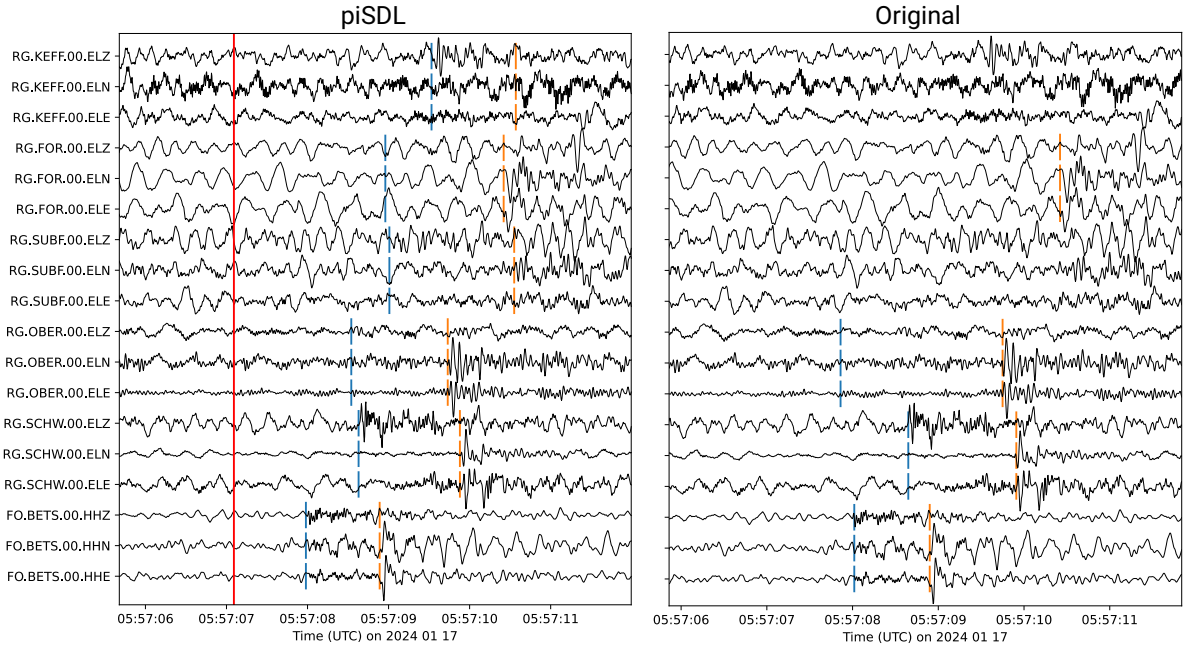
Station	P-picks	S-picks
FO.BETS	16367	15438
RG.RITT	6212	5317
RG.KUHL	2409	2550
FO.OPS	19848	18946
RG.SCHW	6364	6528
RG.OBER	6493	5254
RG.SUBF	10108	12589
RG.STUN	14126	13863
RG.FOR	14166	16142
RG.KEFF	11269	10475
RG.GUNS	10316	10093
RG.LAMP	9435	9264
TOTAL	127113	126459



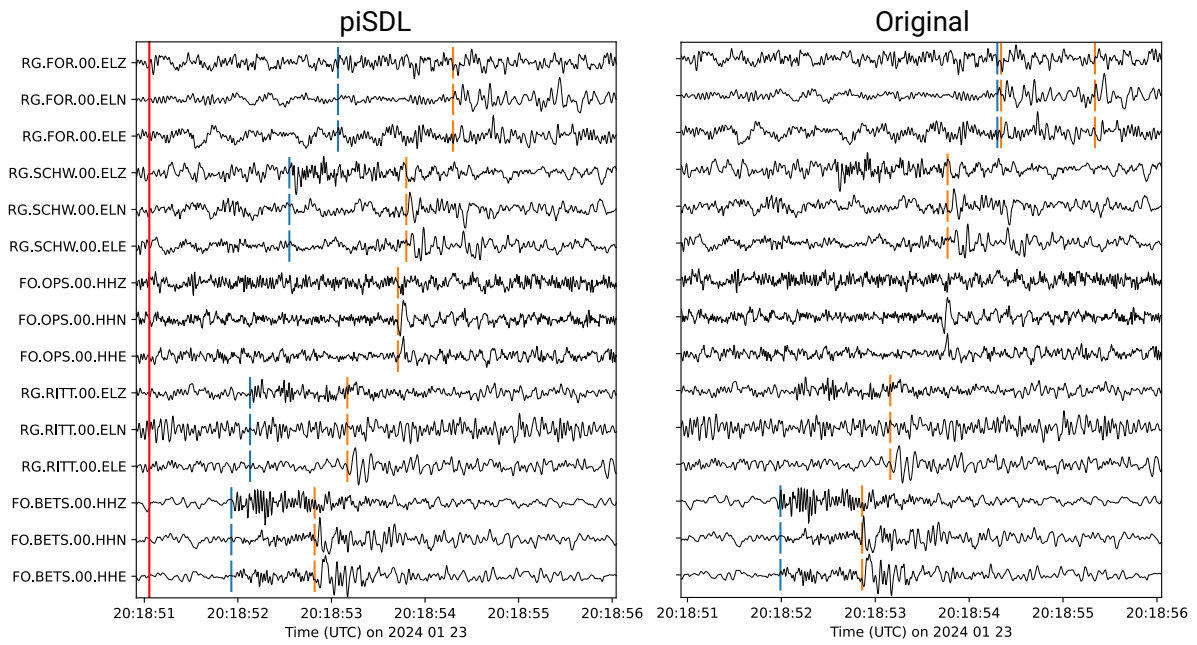
S 6: Comparison of picked phases using PN piSDL1 and PN original. The vertical red line displays the origin time of the event. Note that the stations are not ordered by distance from the epicentre.



S 7: Same as in Fig. S6 but for a different earthquake.



S 8: Same as in Fig. S6 but for a different earthquake.



S 9: Same as in Fig. S6 but for a different earthquake.