Picking DAS records with deep learning

DeepSubDAS and the SeisBench DAS interface

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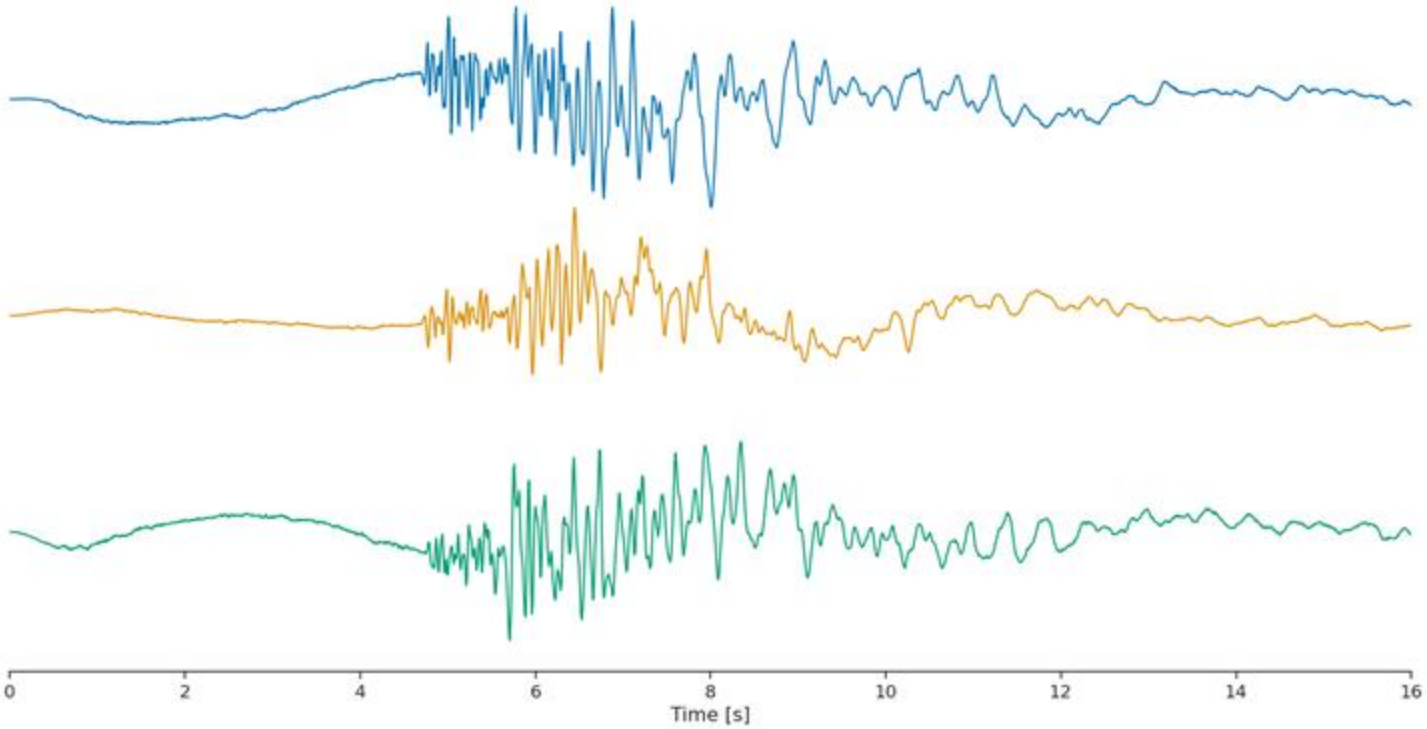
Agenda

- Phase picking with deep learning
- Applying classical models to DAS data
- DAS-native models
- The SeisBench DAS module

What is phase picking?



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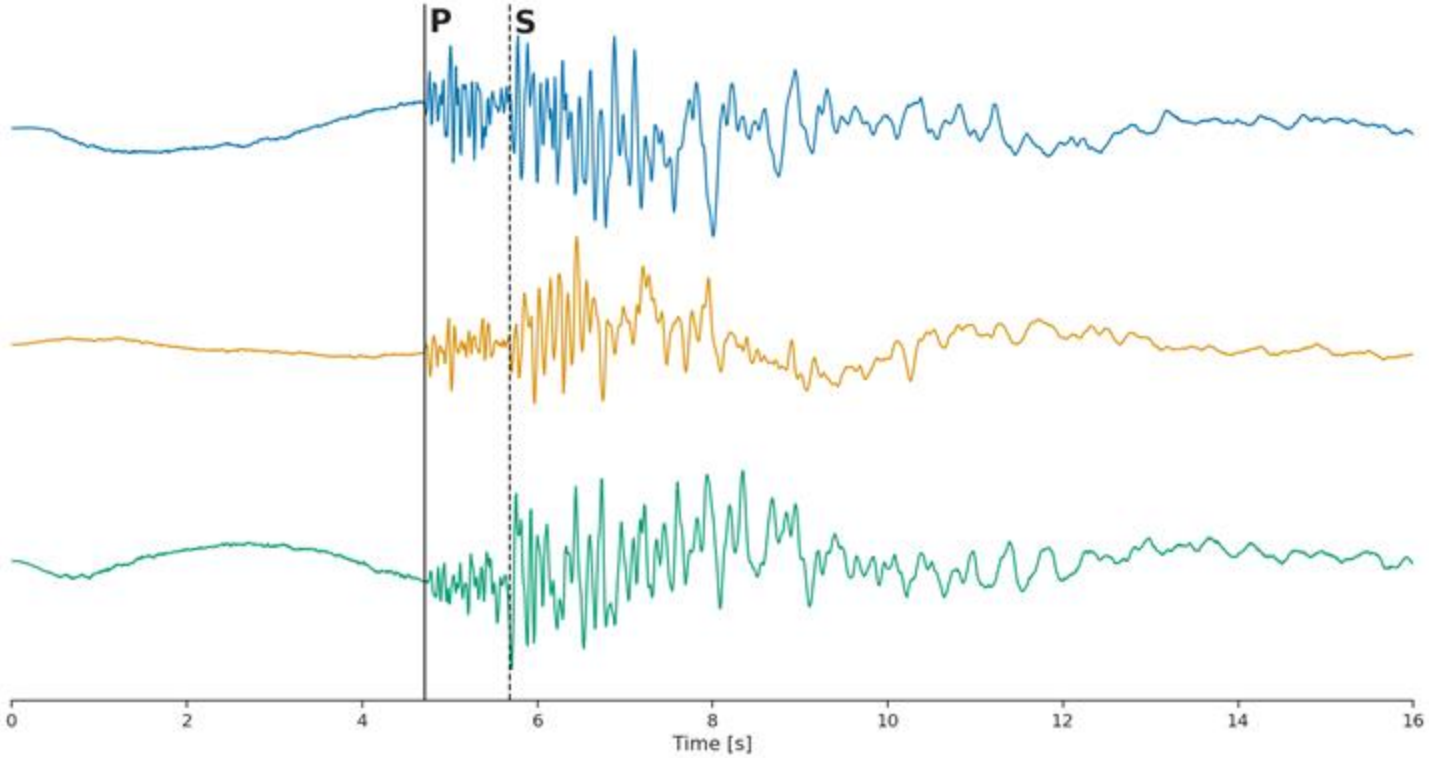
What is phase picking?



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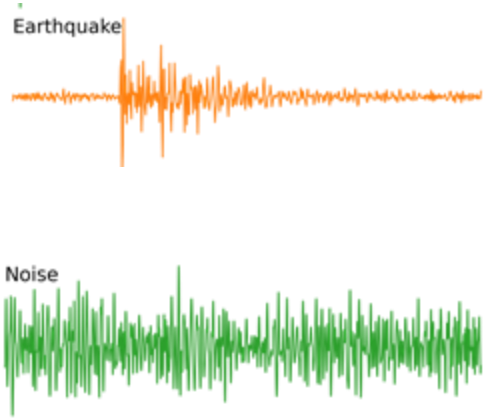
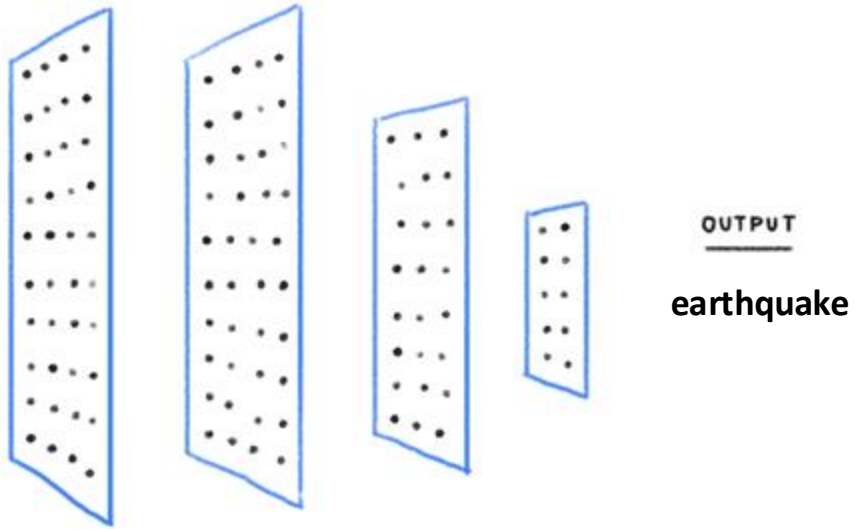
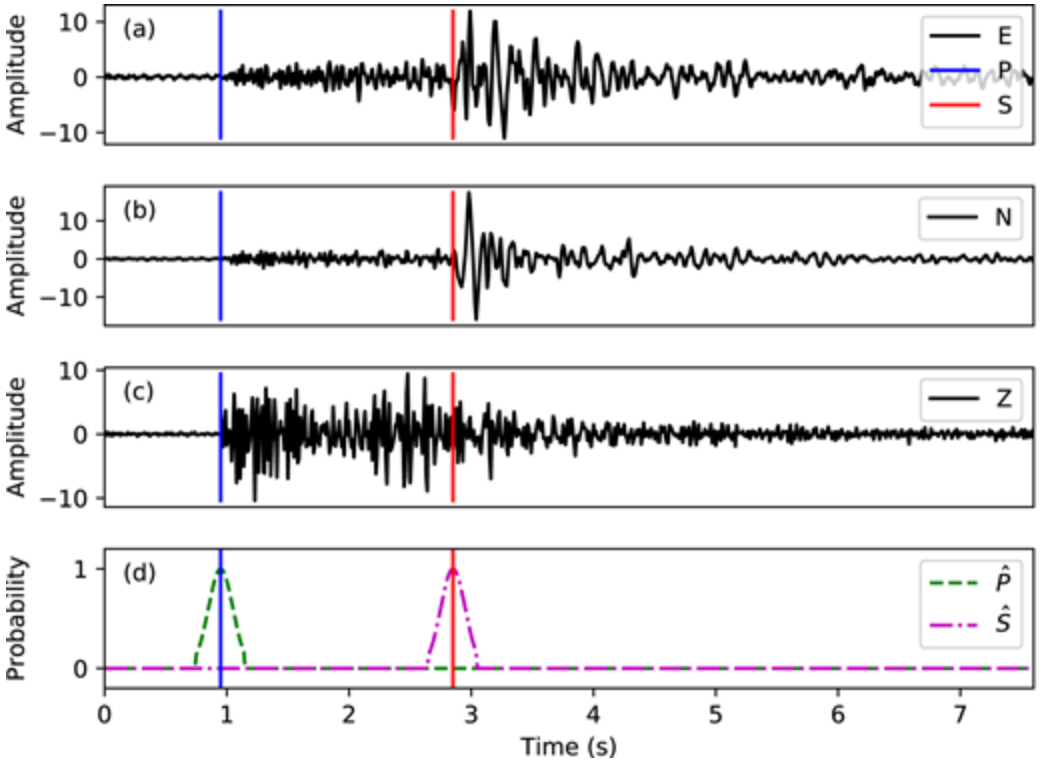
Detecting earthquakes with deep learning





https://raihanrnj.medium.com/deep-learning-simple-image-classification-using-convolutional-neural-network-dog-and-cat-8c99aef29e8

Phase picking as sequence labelling



Zhu & Beroza (2018)

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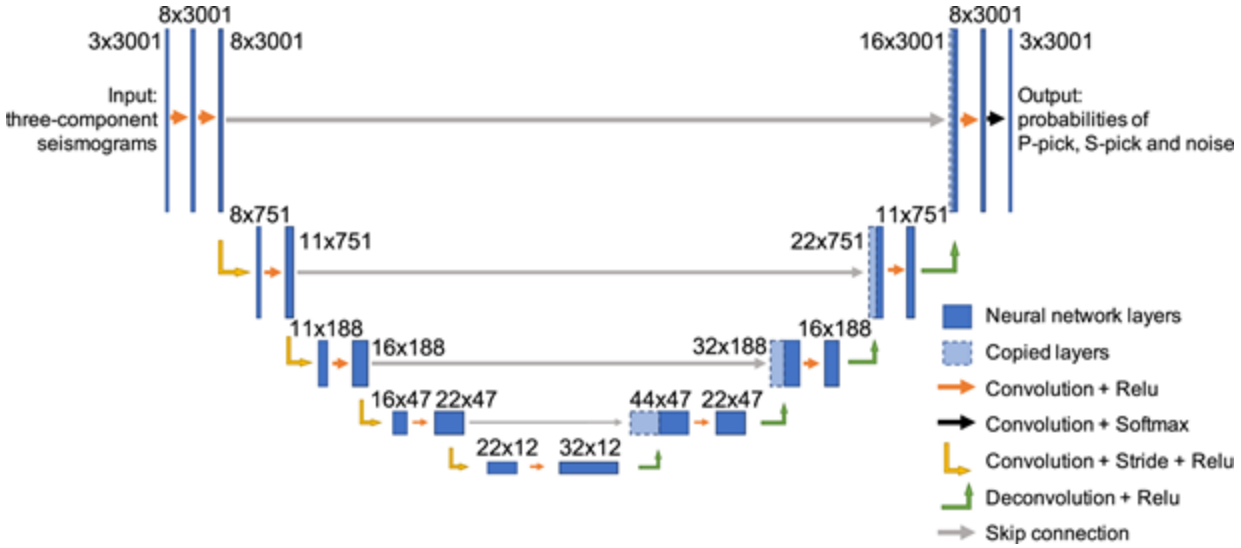
The PhaseNet model



Zhu & Beroza (2018)

- U-Net model
- 30 s @ 100 Hz
- widely used

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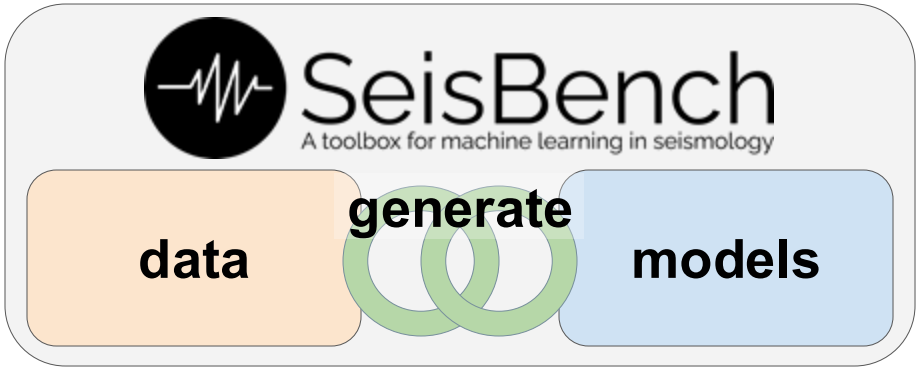
The SeisBench platform



- models with unified APIs
- unified benchmark datasets
- extensive training pipelines

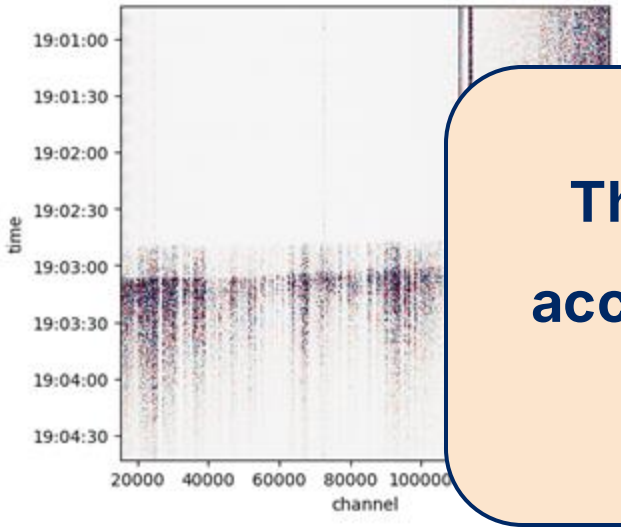
As of 2026, SeisBench has:

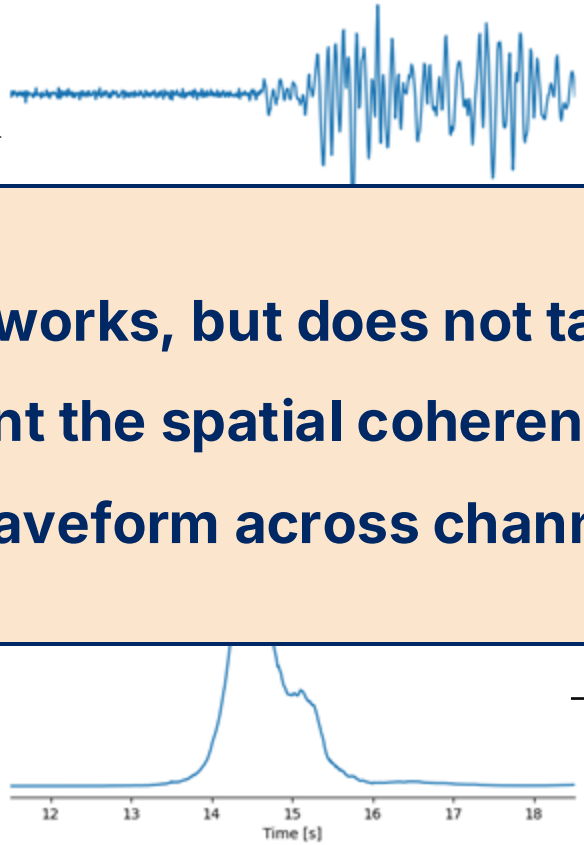
- 20 benchmark datasets
- 16 models (phase picking, denoising, DAS picking, ...)
- > 80 sets of pretrained weights

Global user base (> 800 monthly) and > 20 contributors.

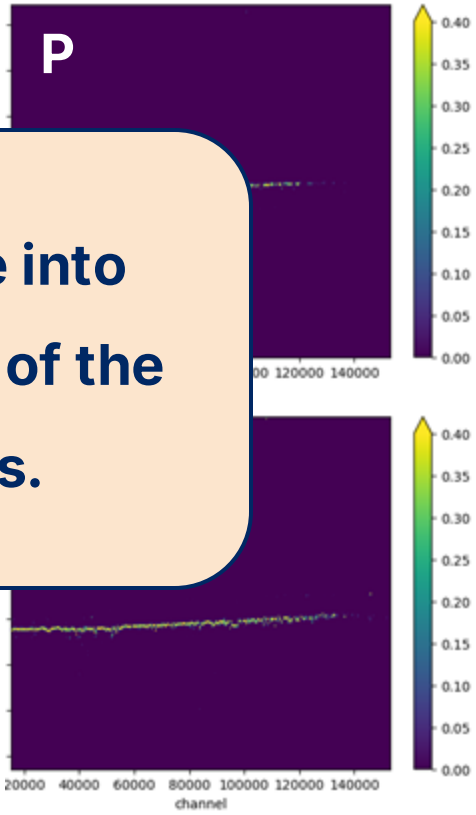
Applying 3C models to DAS

DAS record





Picking result



This works, but does not take into account the spatial coherence of the waveform across channels.

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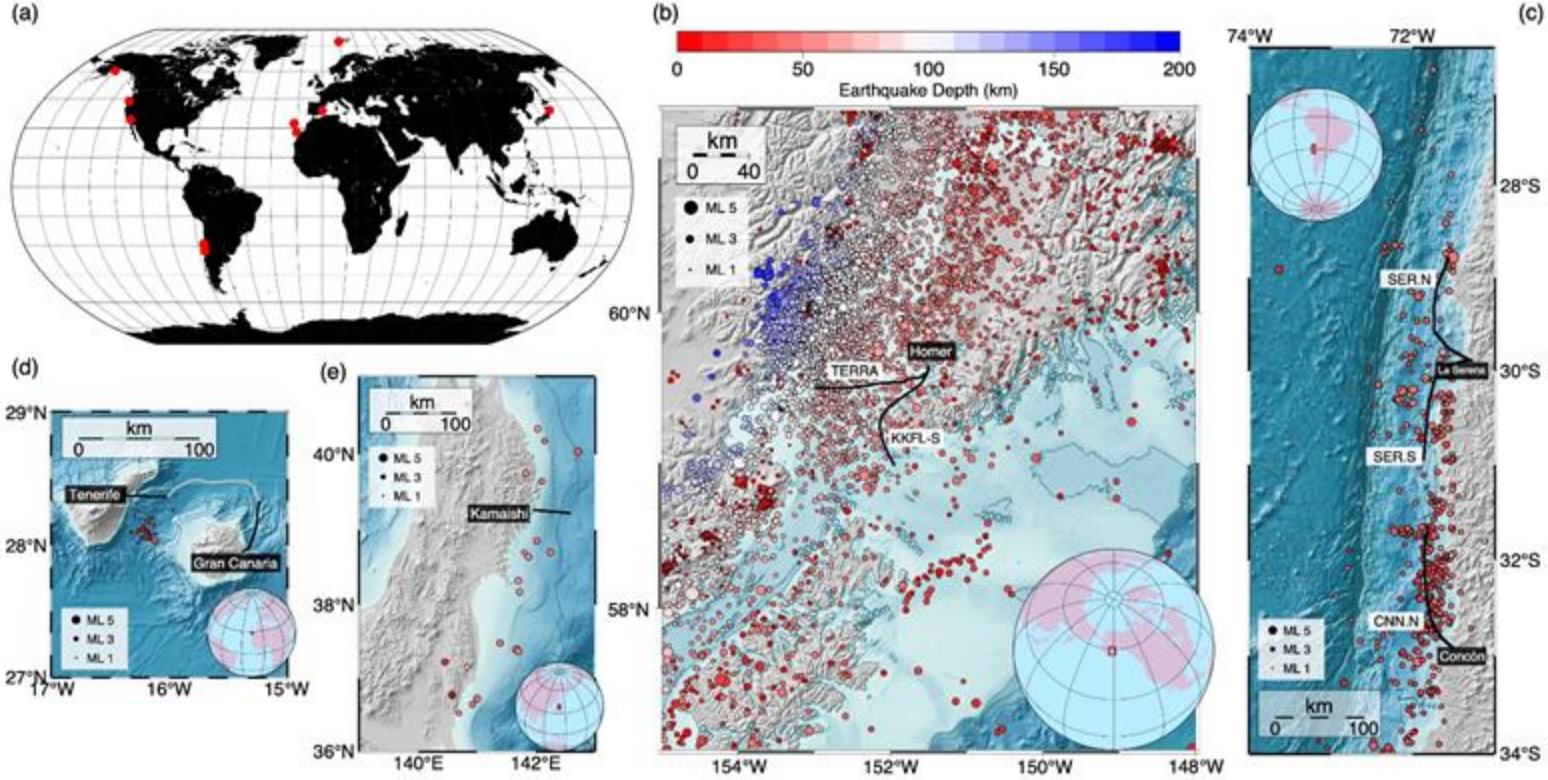
Training data for DAS-native model



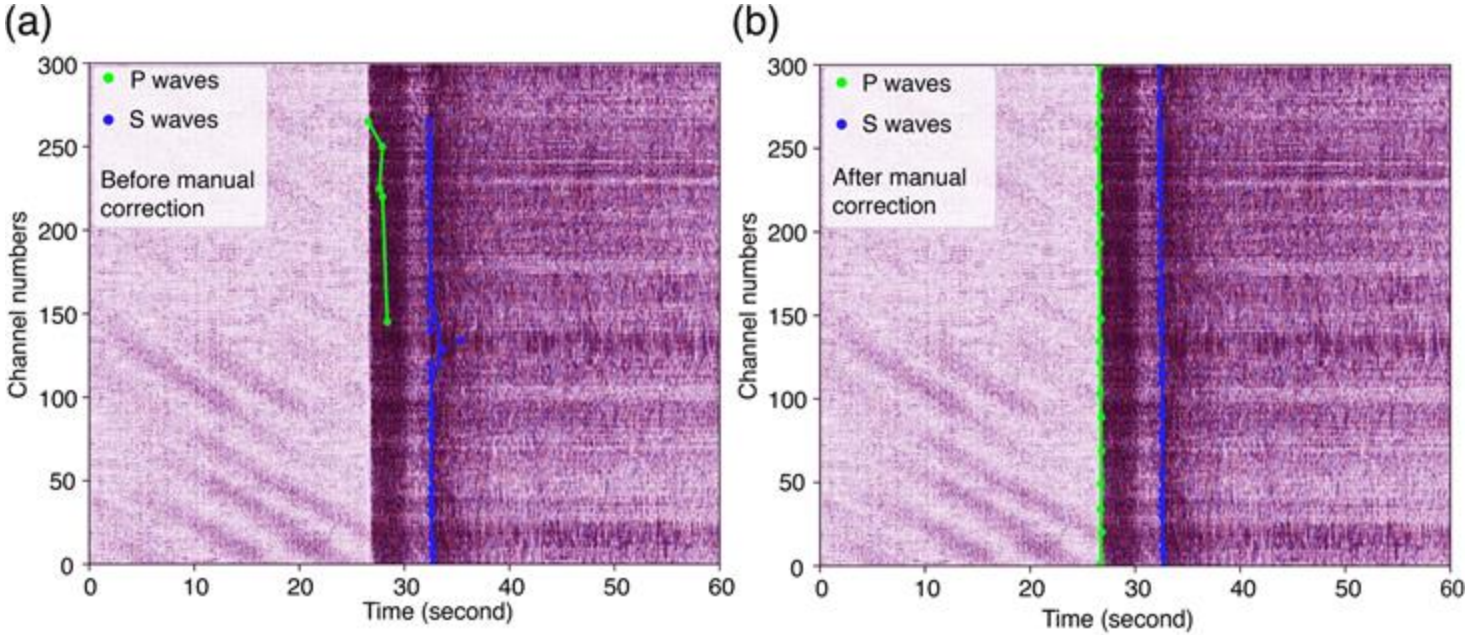
13 fibres, 92 million records, diverse locations and tectonic settings

Xiao et al. (2026)

Semi-automatic labeling

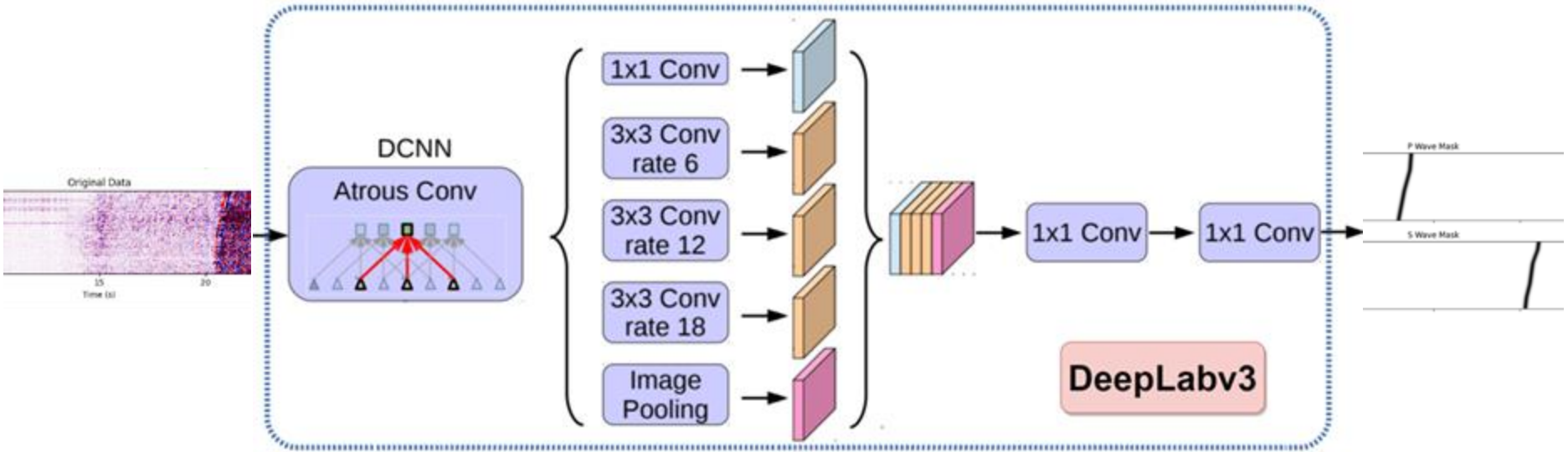
Pick with 3C PhaseNet

Manual review



Xiao et al. (2026)

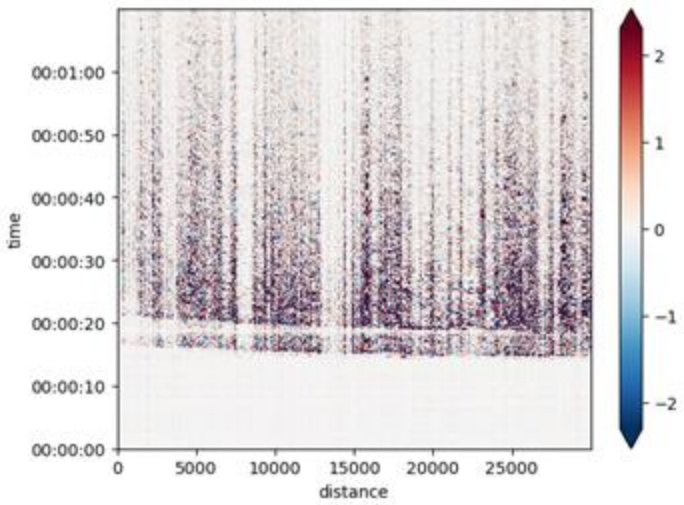
DeepSubDas



Xiao et al. (2026)

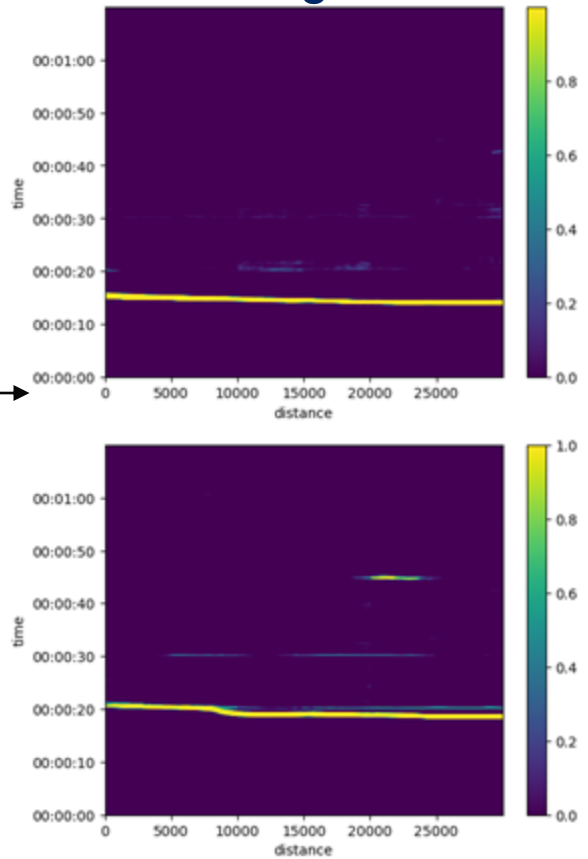
Applying DAS-native models

DAS record



DeepSubDAS

Picking result



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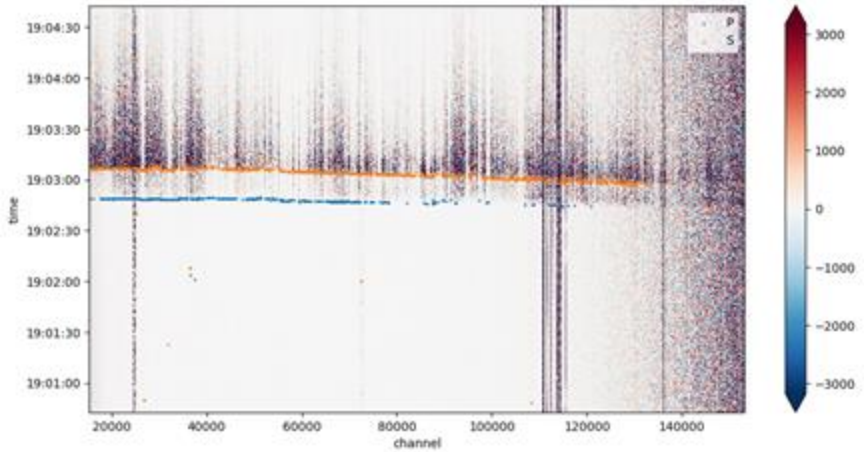
SeisBench DAS integration

SeisBench contains:

- wrappers around 3C models
- DeepSubDAS
- a generic interface for adding new DAS models
- GPU support



Built with das

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Notebook: DAS phase picking with SeisBench

tinyurl.com/seisbench-das

Shortened from:
https://colab.research.google.com/github/seisbench/seisbench_training/blob/main/2026_04_15_submerse.ipynb

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