



Joint processing and inversion of active and passive ultrasonic data

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Background

Application of **active and passive ultrasonic measurements** in civil engineering:

- detect damages and deteriorations;
- investigate concrete structures;
- measure thickness;
- locate and characterize built-in components or inhomogeneities.

Challenges for imaging techniques:

- steeply dipping interfaces;
- complex structures.

Question: How to improve the imaging of complicated structures in concrete?

Tools: FWI, CWI, RTM, AE.



(Ernst Niederleithinger, Christian Sodeikat et al., 2021)



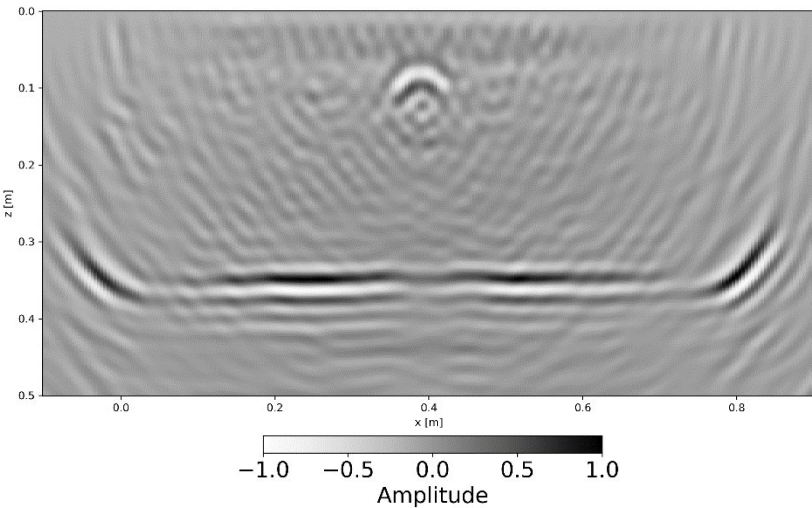
(Handbook of Nondestructive Evaluation 4.0, 2022)

Intermediate results

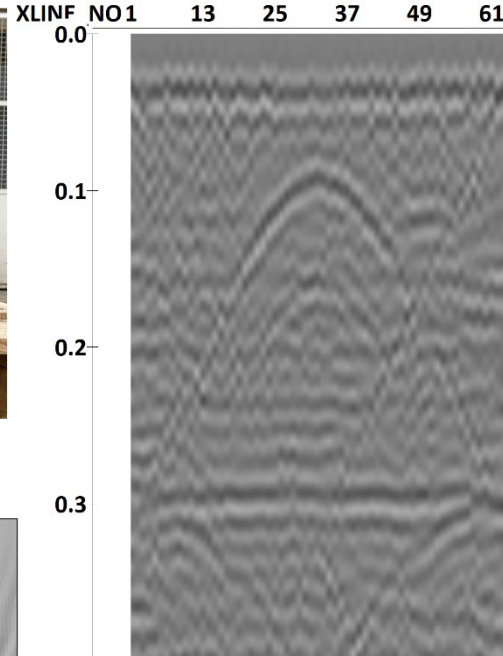
concrete specimen



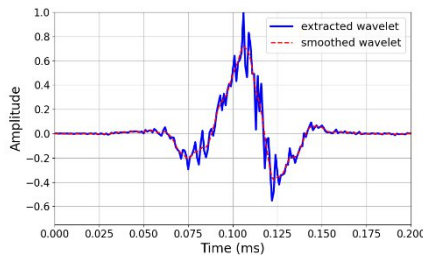
SAFT



raw data

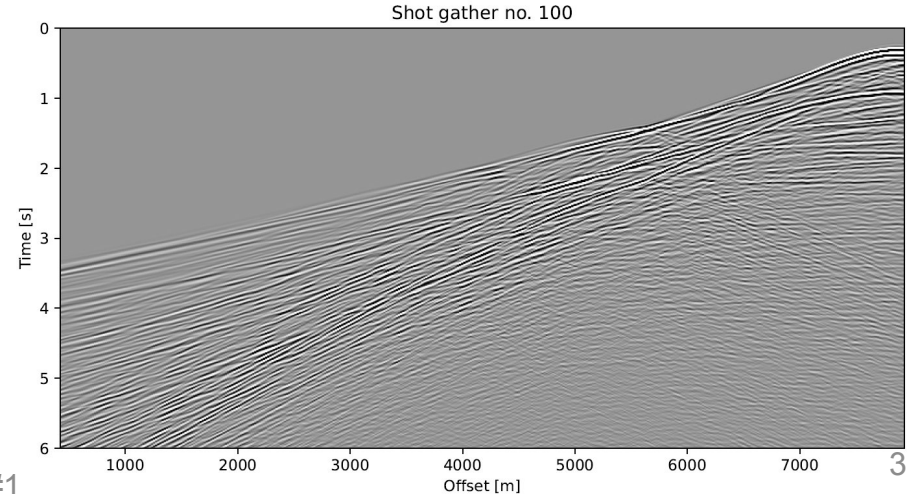
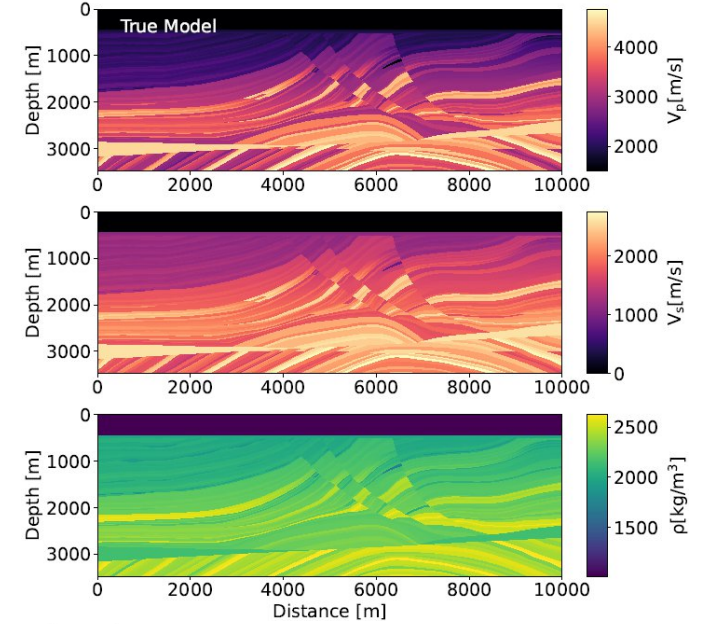


signal (work in progress)



launching DENISE

DENISE logo with 'BLACK EDITION' text. Below the logo are two small plots showing wave patterns. The bottom plot includes logos for the University of Applied Sciences (FH) and KIT (Karlsruher Institut für Technologie). Text below the logos reads: 'Daniel Köhn, Denise De Nil, André Kurzmann'.



Next steps

- Complete wavelet estimation;
- Additional processing;
- Forward modeling;
- FWI;
- Continue joint work on compressed sensing with Jasmien.

Thank you for your attention

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