

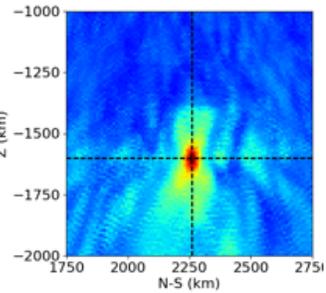
On the generation of geometry-independent noise models for microseismic monitoring purposes

Claire Birnie and Matteo Ravasi, KAUST

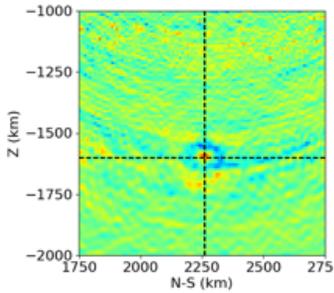
Field Results: ToC2ME, Canada

Motivation

Diffraction Stack Imaging

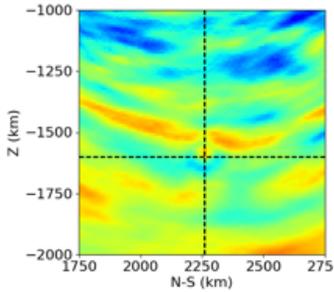
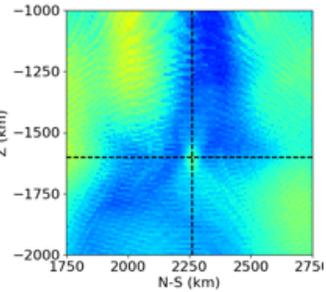


Reverse Time Migration

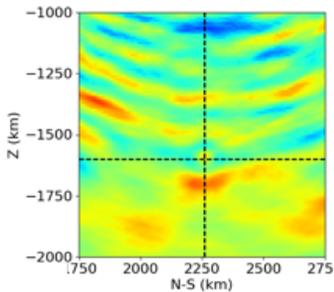
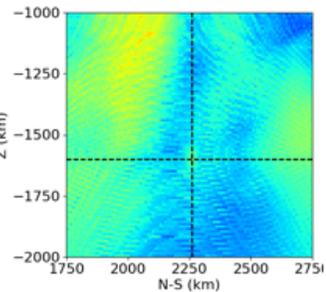


WGN

Recorded



ICOVA



Methodology

Compute Noise Statistics

$$\mu, C^{-1/2}$$

Generate Noise Model

$$\tilde{d}_{xt} = C^{-1/2}b + \mu$$

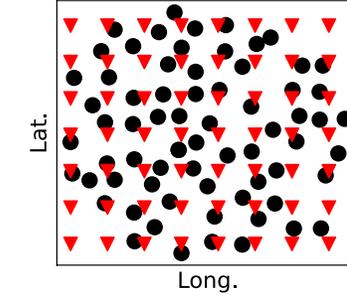
Create Transformation Kernel

$$k(x_i, x_j) = c \cdot \exp \frac{d(x_i, x_j)^2}{2l^2}$$

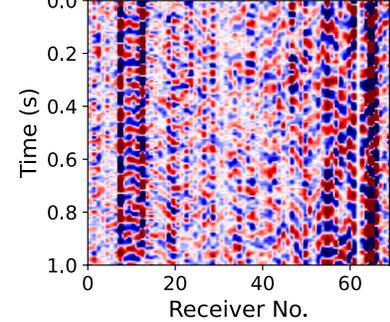
Transform Noise Model

$$\tilde{d}_{x^*t} = K_*^T (K + \epsilon I)^{-1} \tilde{d}_{xt}$$

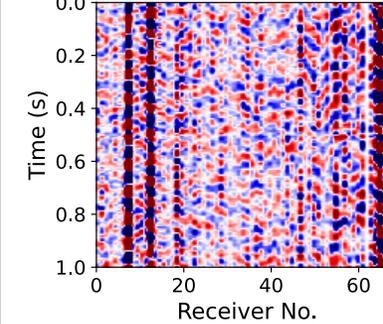
Receiver Geometries



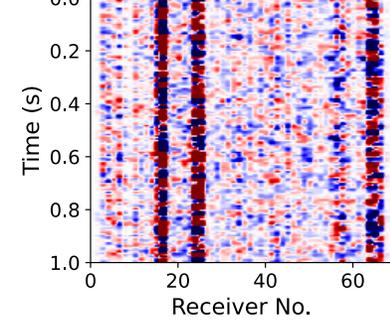
Reference Noise



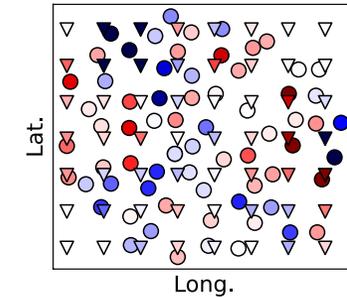
O.G. Noise Model



N.G. Noise Model



t=0



t=250

