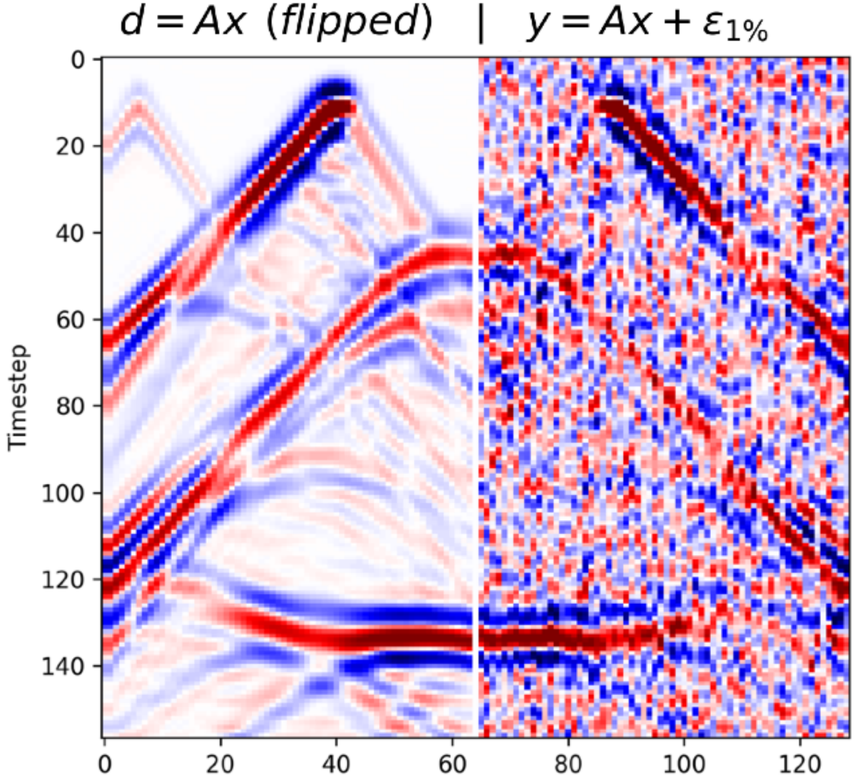
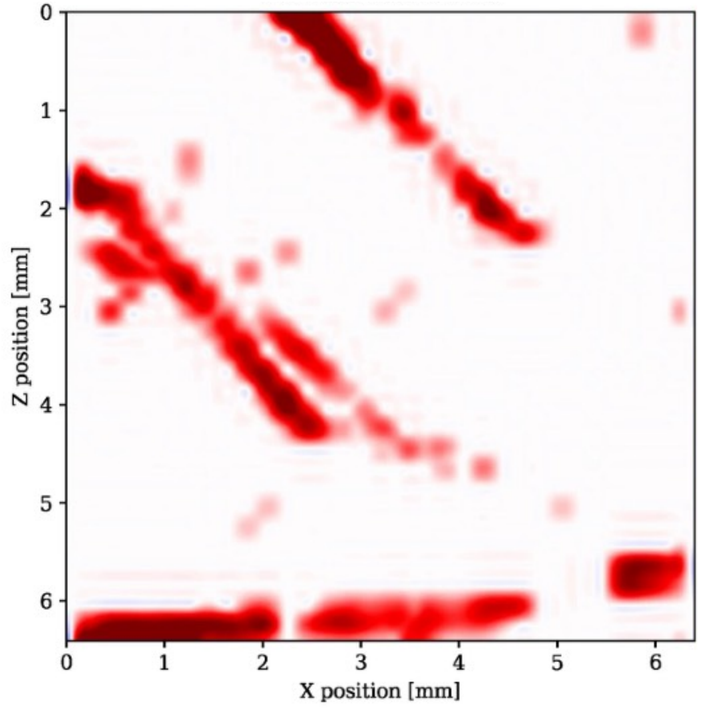
Inverse Problem

Given acoustic data at receivers calculate acoustic pressure at $T = 0$



Invert data that is noisy, sparse & from limited view receiver geometry



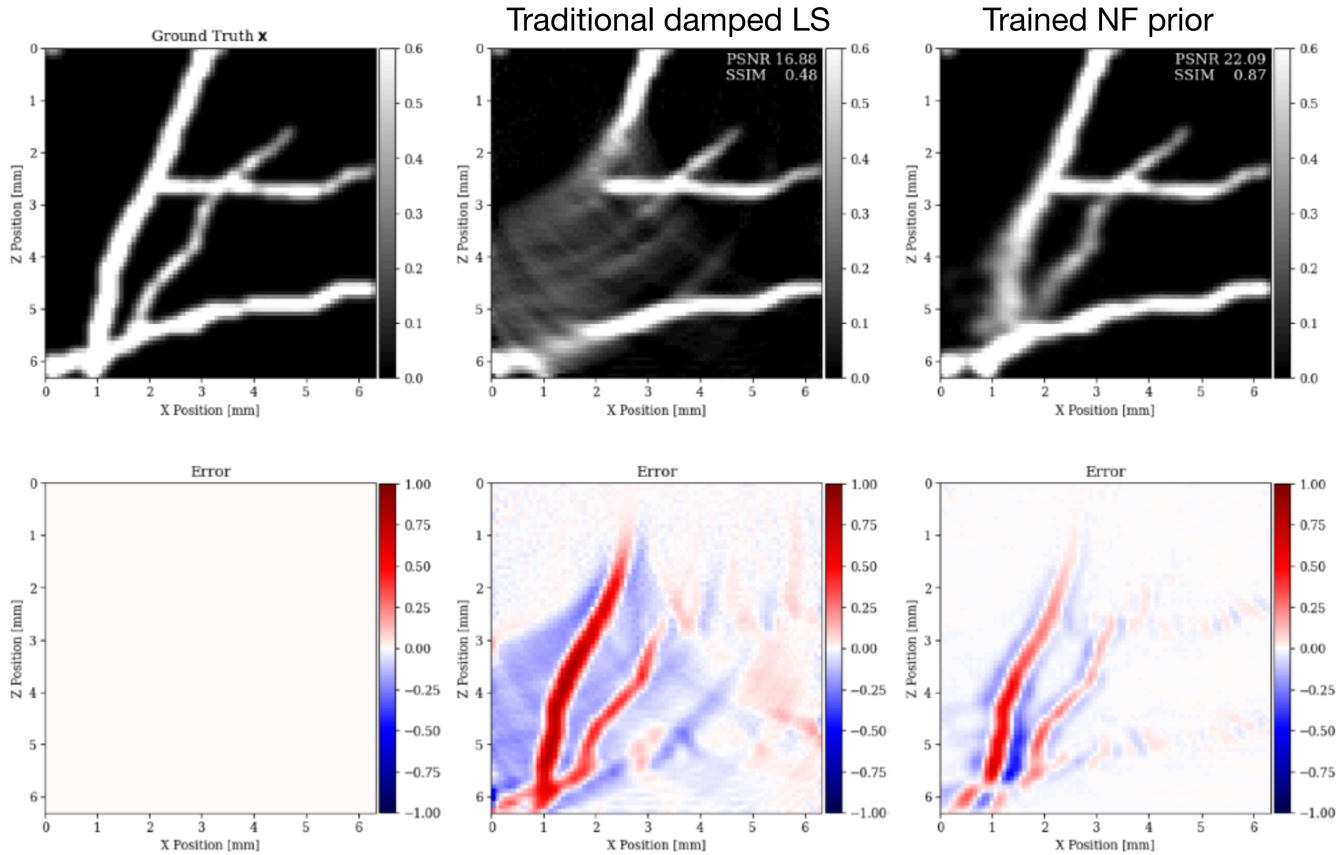
$$\underset{\mathbf{x}}{\operatorname{argmin}} \ \frac{1}{2}\|A\mathbf{x} - \mathbf{d}\|_2^2 + \log R(\mathbf{x})$$

MAP Optimization with NFs

Results with photoacoustic medical imaging reconstruction. Operator A is a forward wave solve representing ultrasound wave propagation

$$\underset{\mathbf{x}}{\operatorname{argmin}} \ \frac{1}{2}\|A\mathbf{x} - \mathbf{d}\|_2^2 + \log R(\mathbf{x})$$

$$\underset{\mathbf{z}}{\operatorname{argmin}} \ \frac{1}{2}\|AG_\theta(\mathbf{z}) - \mathbf{d}\|_2^2 + \frac{1}{2}\|\mathbf{z}\|_2^2$$



Orozco, Rafael, et al. "Photoacoustic imaging with conditional priors from normalizing flows." *NeurIPS 2021 Workshop on Deep Learning and Inverse Problems*. 2021.