SLIM

Forward Problem

Given initial pressure distribution calculate pressure at receivers:

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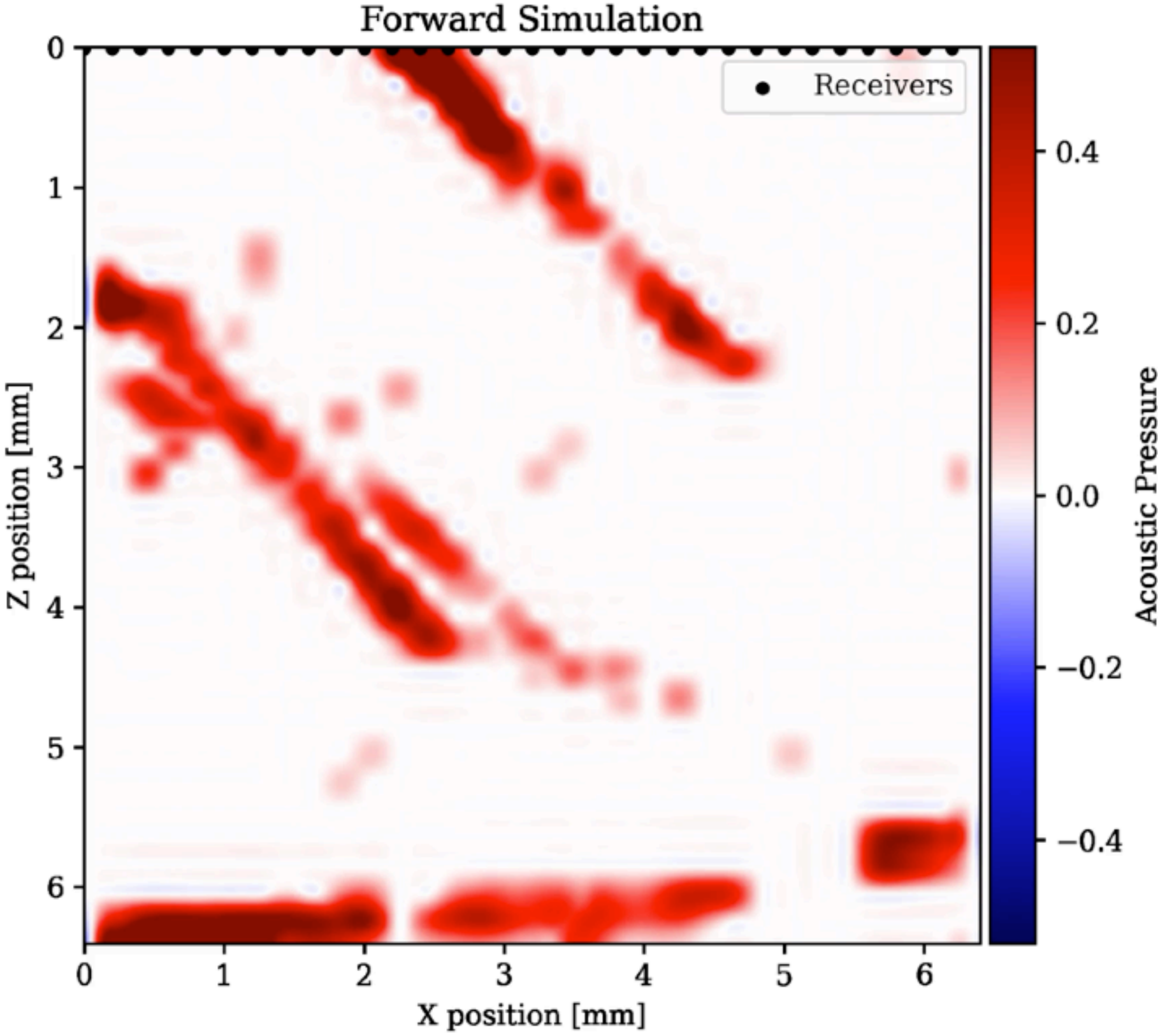
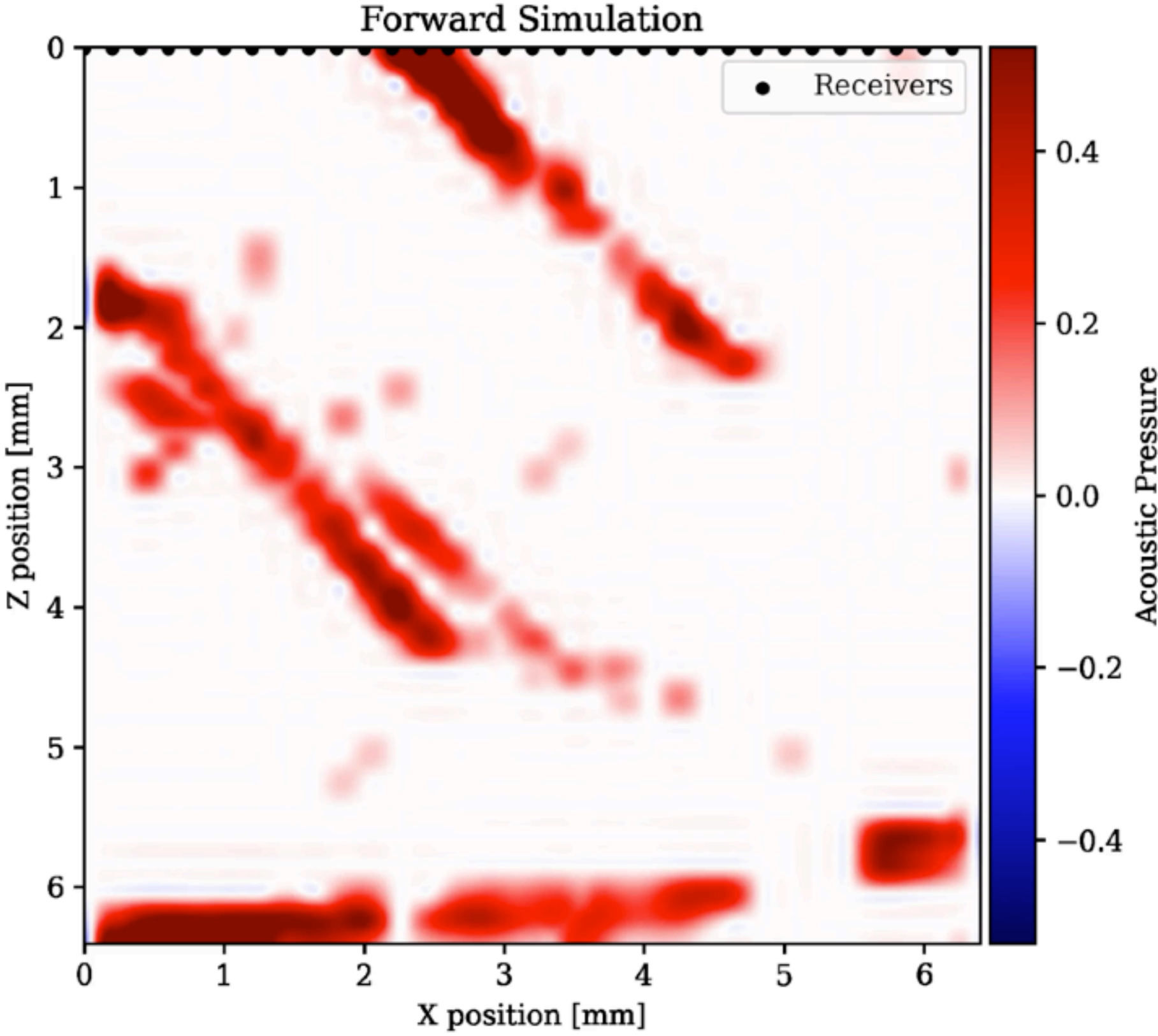
$$u(x,0) = p_0(x)$$

$$\frac{\partial}{\partial t} u(x,0) = 0$$

$$\frac{1}{c_0^2}\frac{\partial^2}{\partial t^2}u(x,t) - \Delta u(x,t) = 0$$


Forward Simulation
Receivers
Z position [mm]
X position [mm]
Acoustic Pressure
0
1
2
3
4
5
6
0.4
0.2
0.0
−0.2
−0.4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Receivers
Z position [mm]
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0.4
0.2
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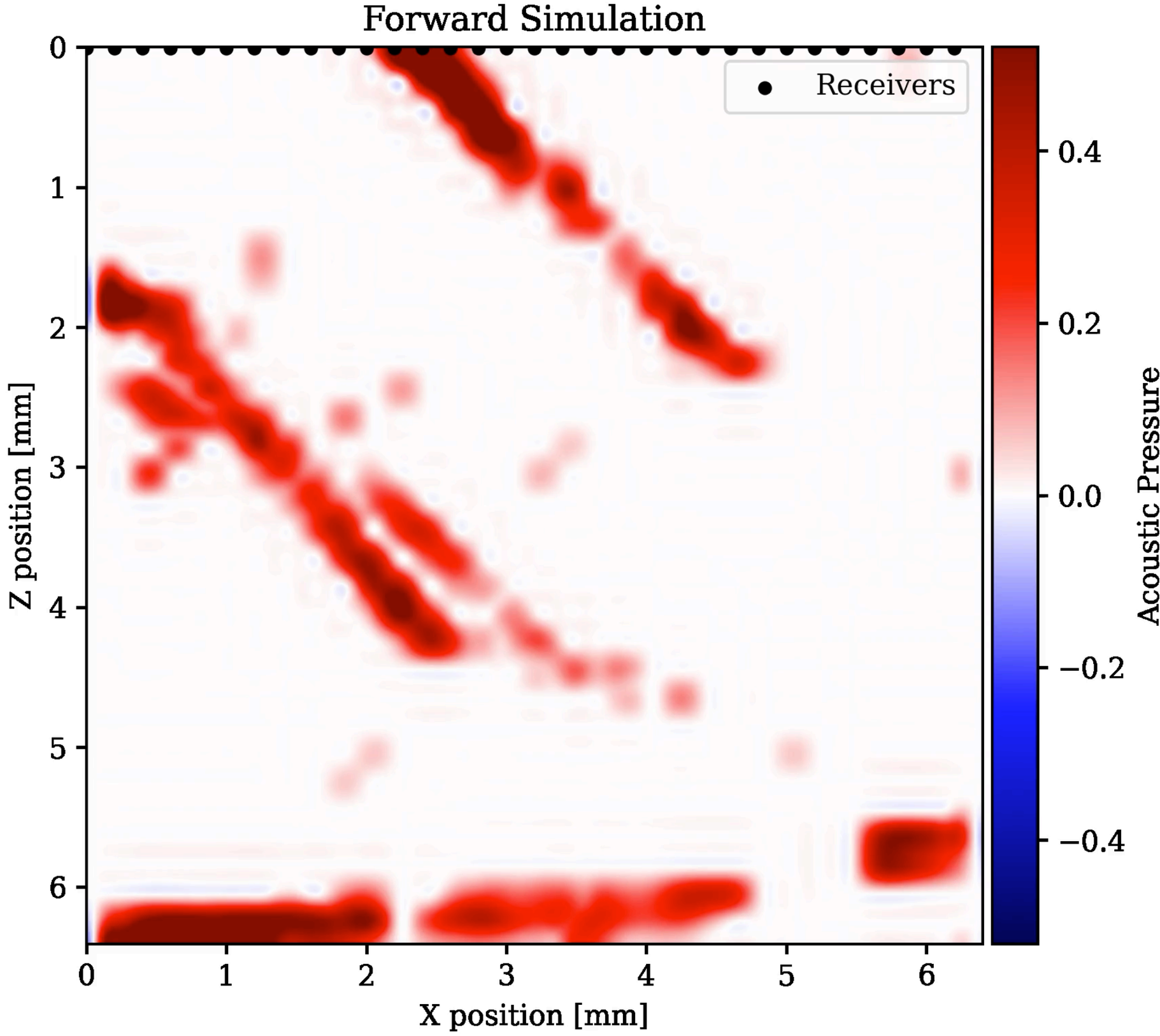
−0.4


Forward Simulation
Receivers
Z position [mm]
X position [mm]
Acoustic Pressure
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−0.2
−0.4

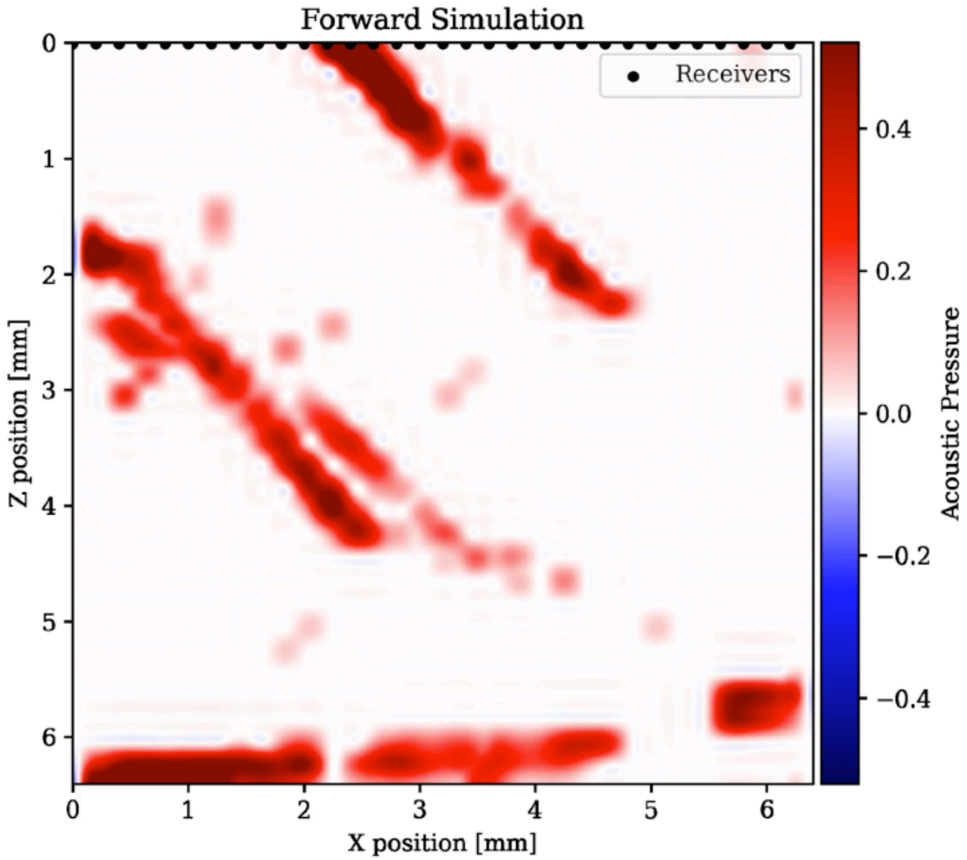
Forward Problem

Given initial pressure distribution calculate pressure at receivers:

$$\frac{1}{c_0^2}\frac{\partial^2}{\partial t^2}u(x,t) - \Delta u(x,t) = 0$$

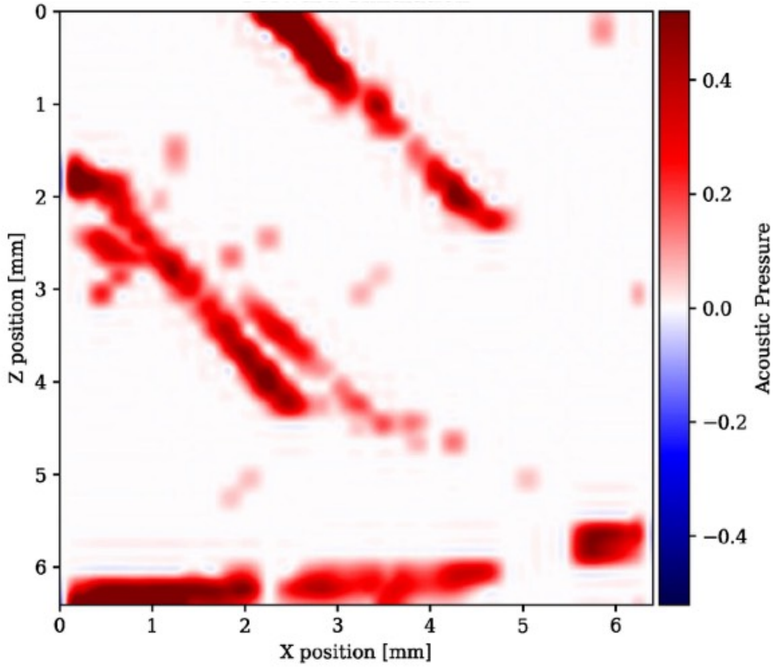
$$u(x,0) = p_0(x)$$

$$\frac{\partial}{\partial t}u(x,0) = 0$$

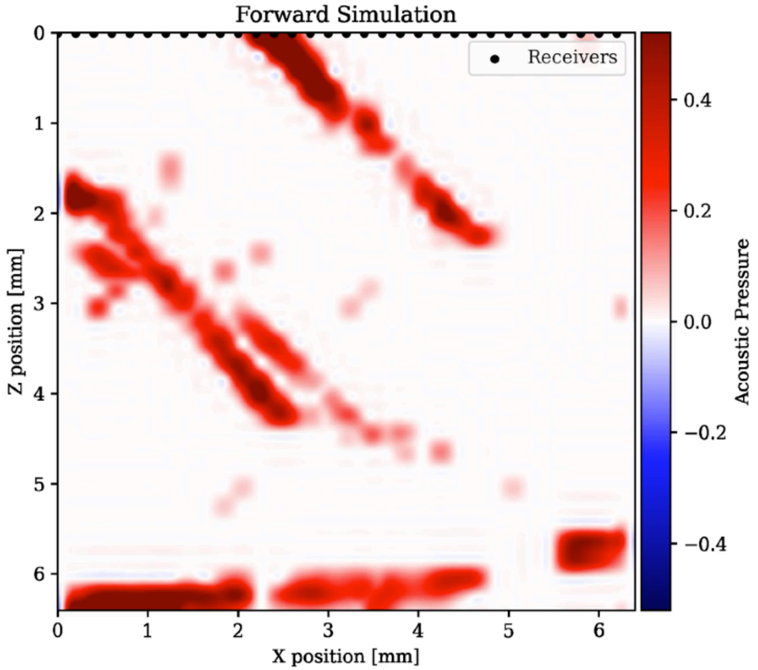


Forward Problem

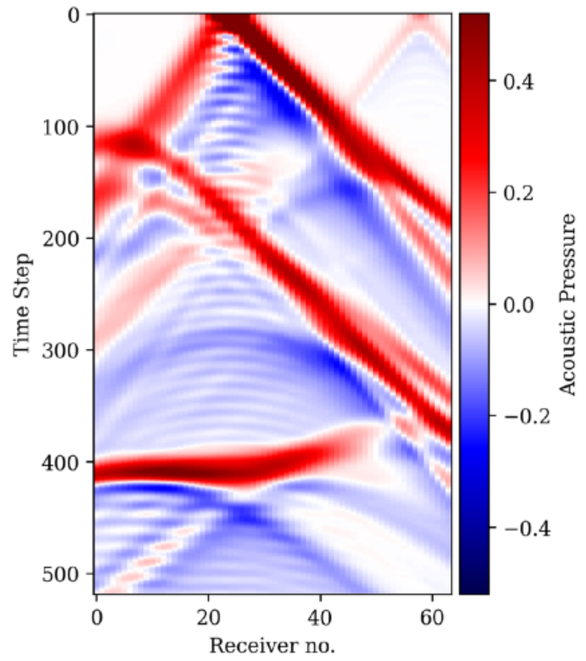
Can be expressed as linear operator $\mathbf{d} = A\mathbf{p}$



p = initial pressure condition



A**p** = forward wave operator



d = data at receivers

Huynh, Nam, et al. "Photoacoustic imaging using an 8-beam Fabry-Perot scanner." Photons Plus Ultrasound: Imaging and Sensing 2016. Vol. 9708. International Society for Optics and Photonics, 2016.