

Time reversal and spectral wave engineering via damping pulses

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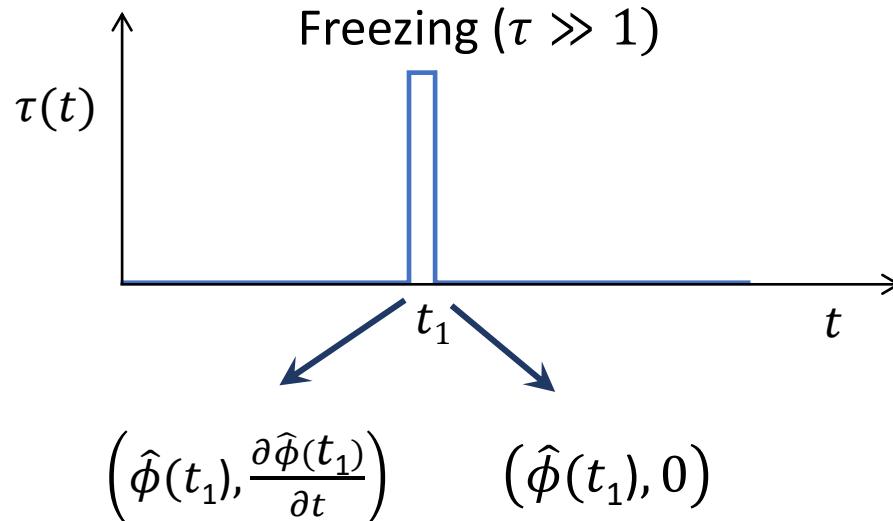
DAMPING-DRIVEN TIME REVERSAL OF WAVES

- Let us consider a wavefield described by:

$$\frac{\partial^2 \hat{\phi}(\mathbf{k}, t)}{\partial t^2} + \tau(t) \frac{\partial \hat{\phi}(\mathbf{k}, t)}{\partial t} + \omega_0^2 \hat{\phi}(\mathbf{k}, t) = 0$$

Time Irreversible term

We apply a damping pulse:



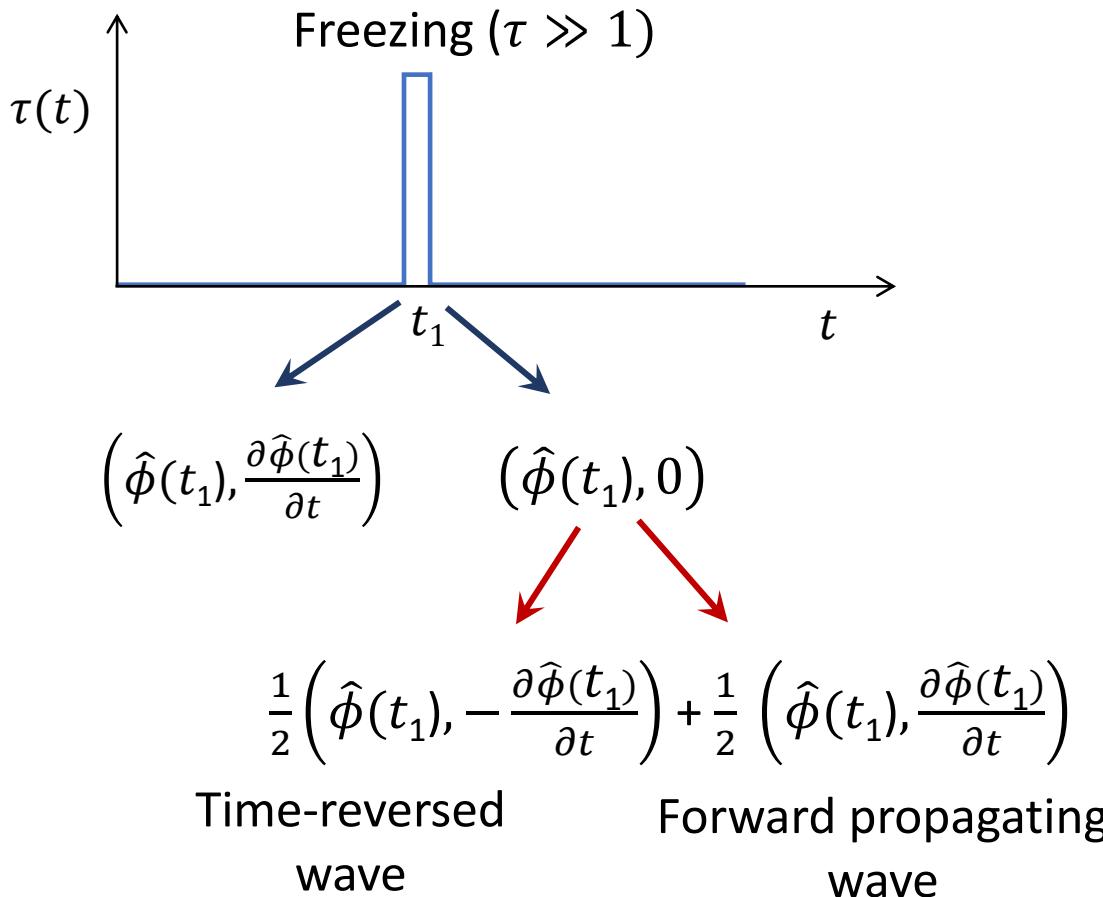
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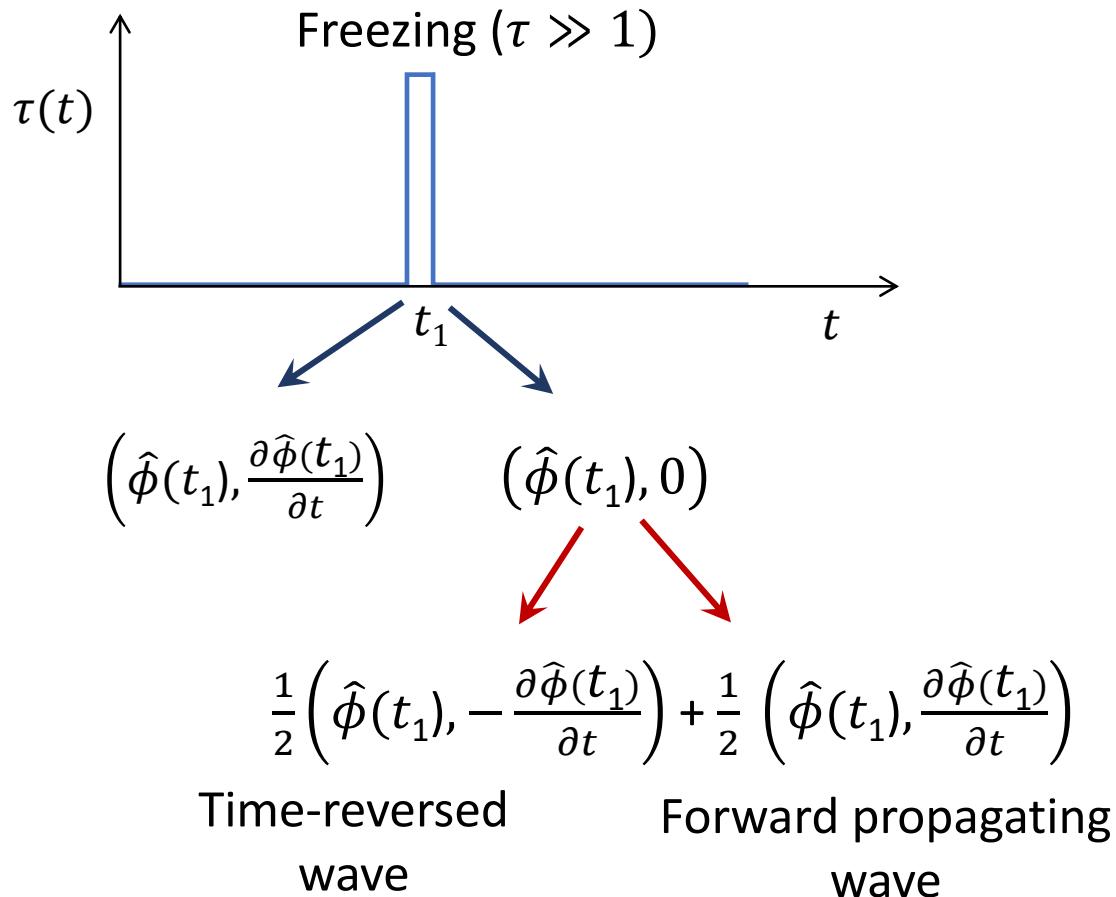
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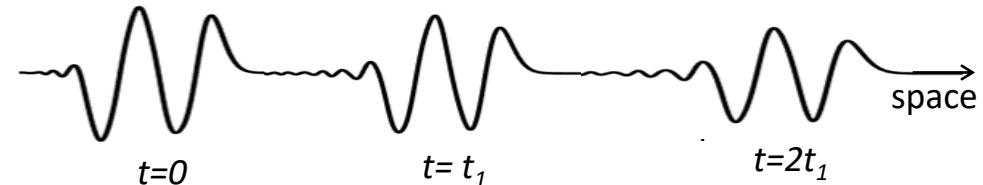
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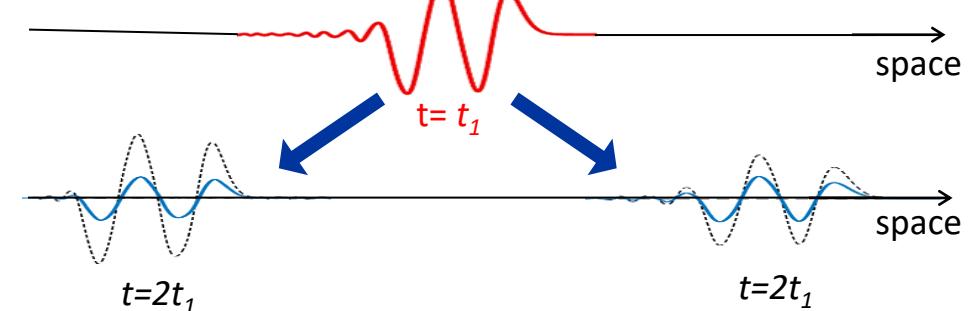


Comparison of the wave propagation

(a) Propagation without DTR

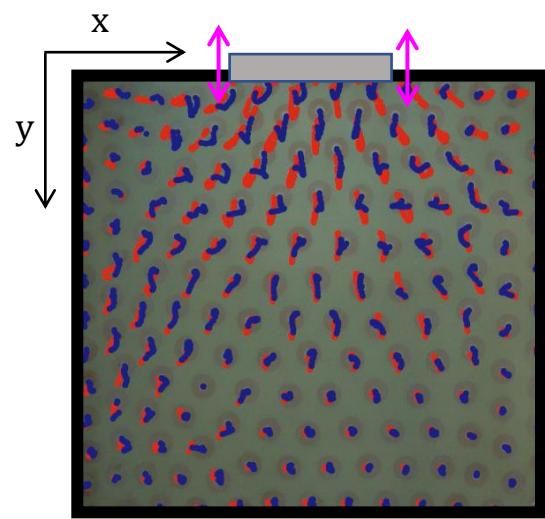
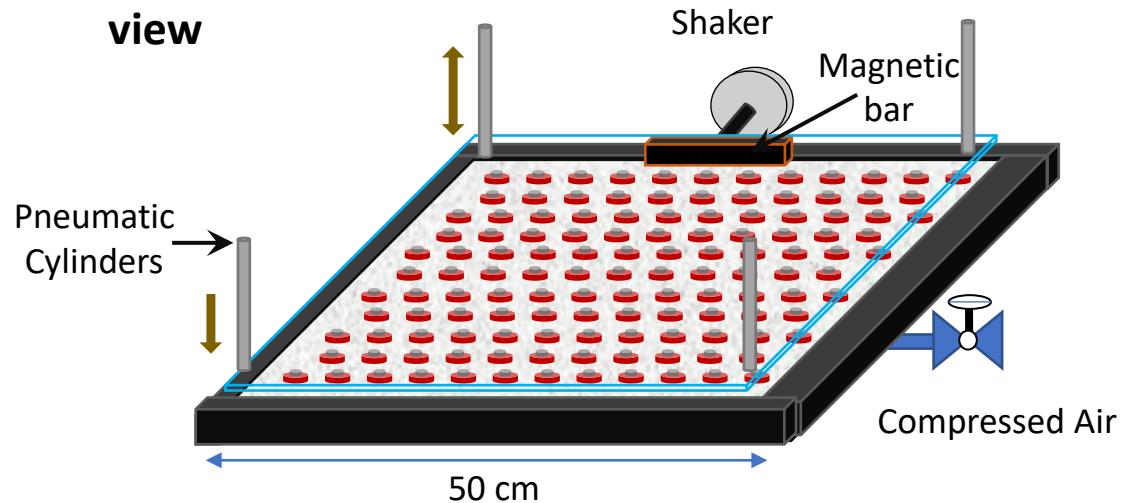


(b) Propagation with DTR

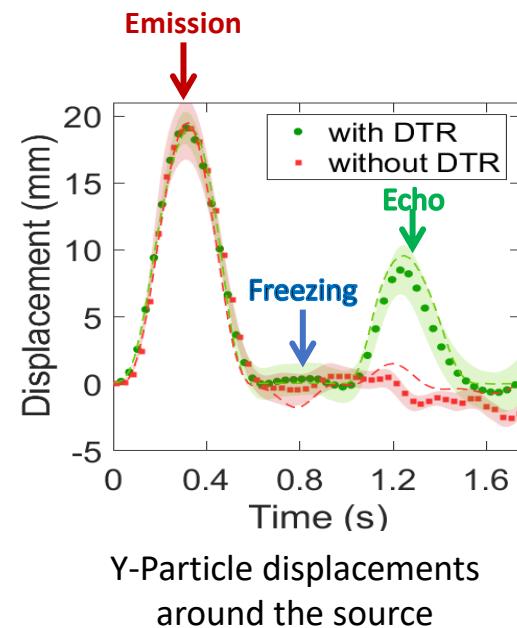


1. EXPERIMENTAL DEMONSTRATION

Isometric view



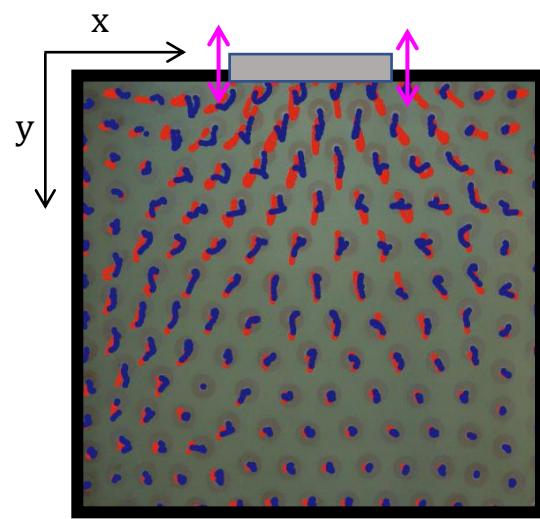
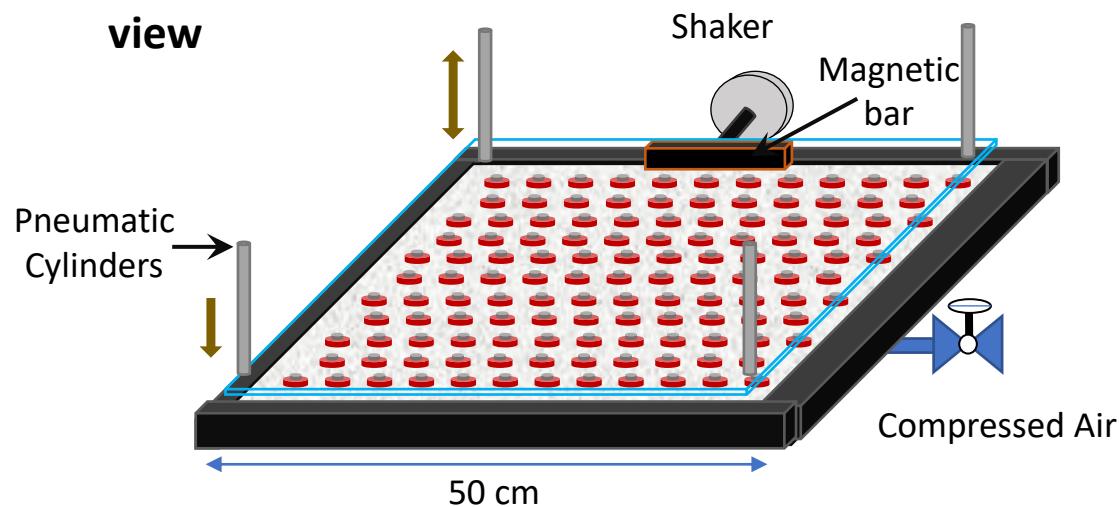
Particle Trajectories



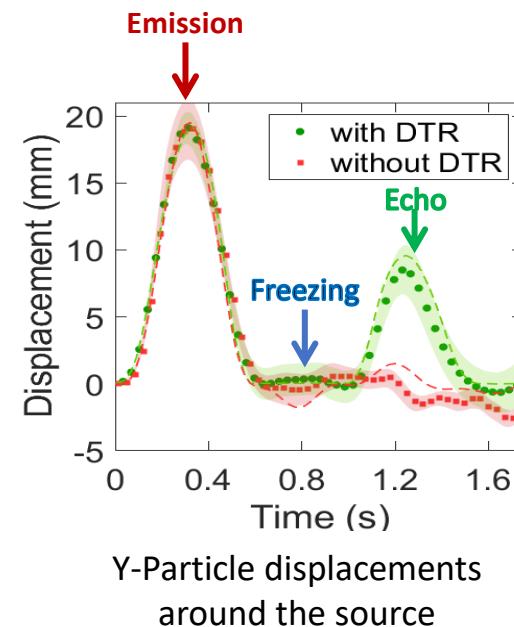
Y-Particle displacements around the source

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Isometric view

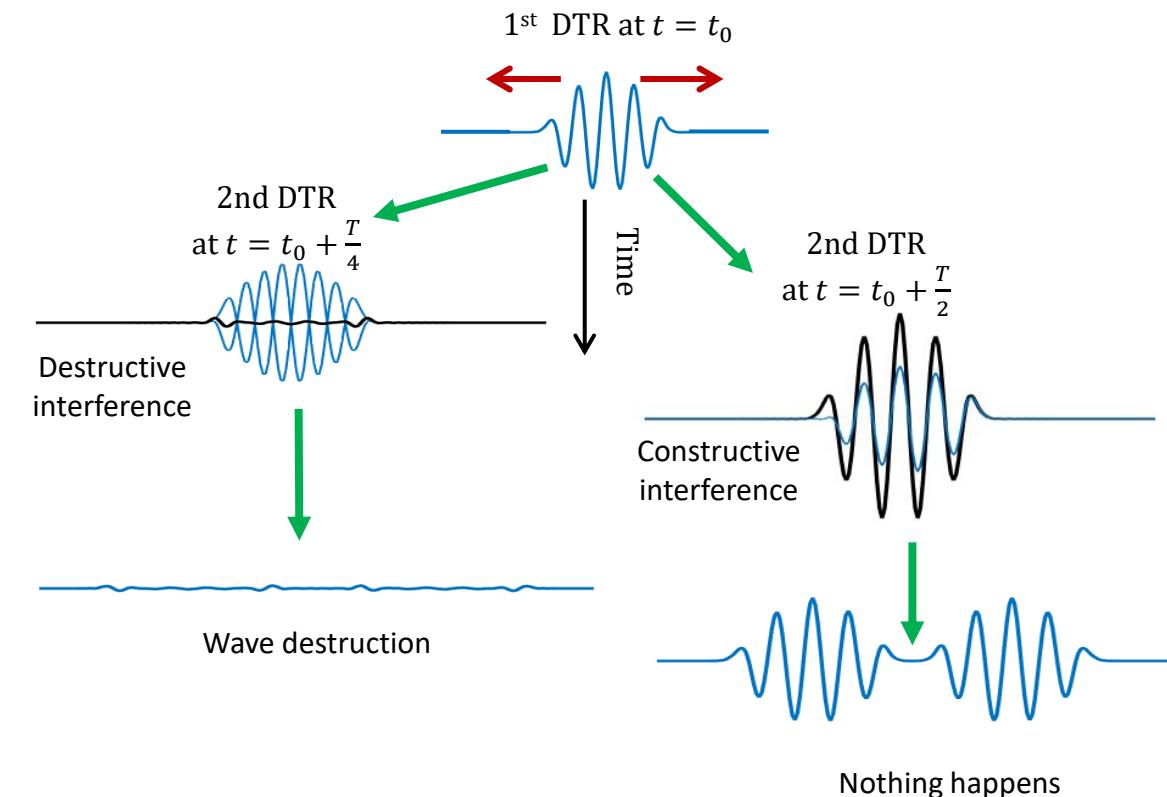


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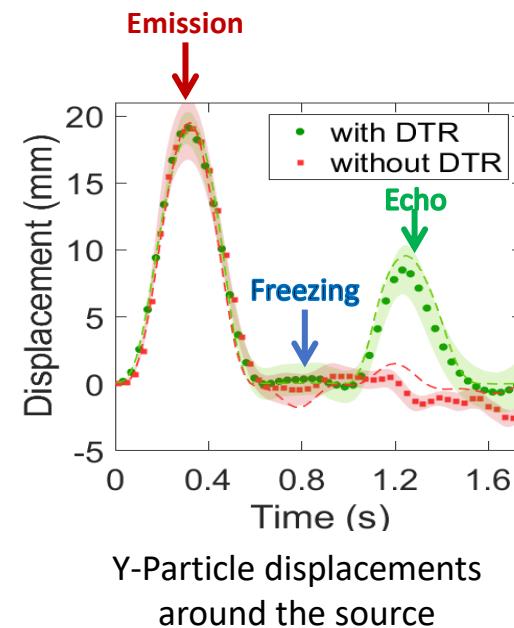
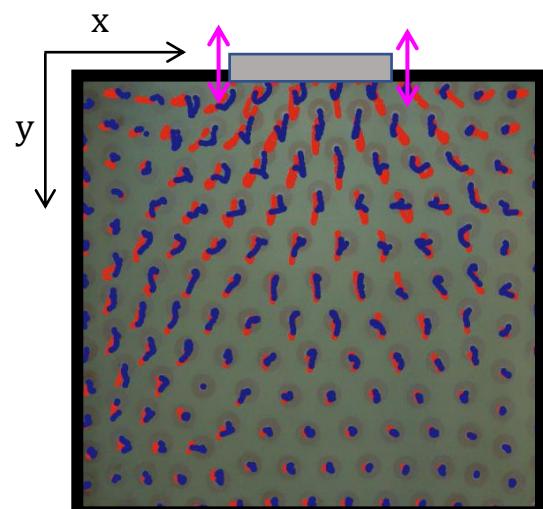
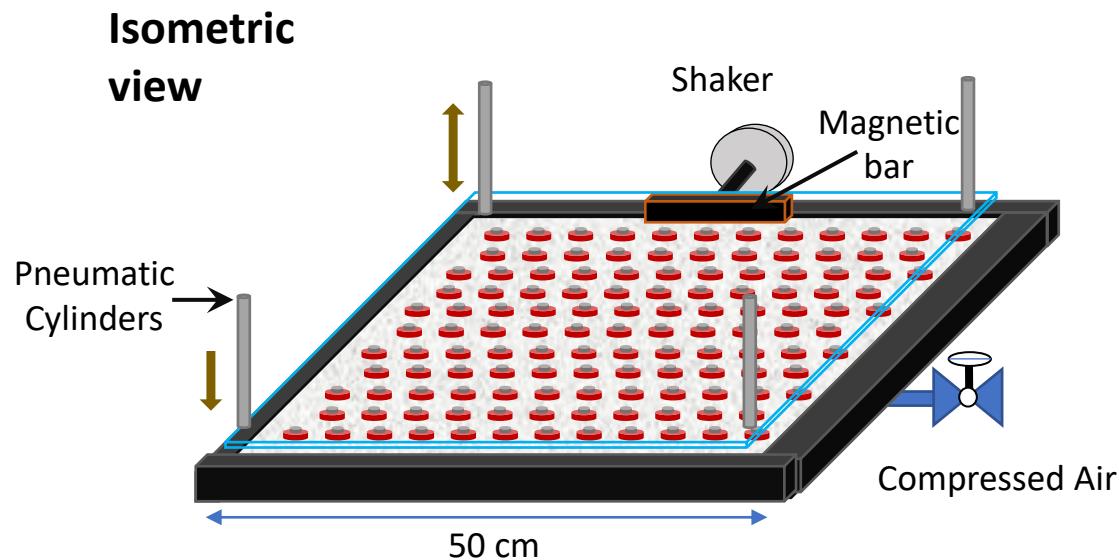


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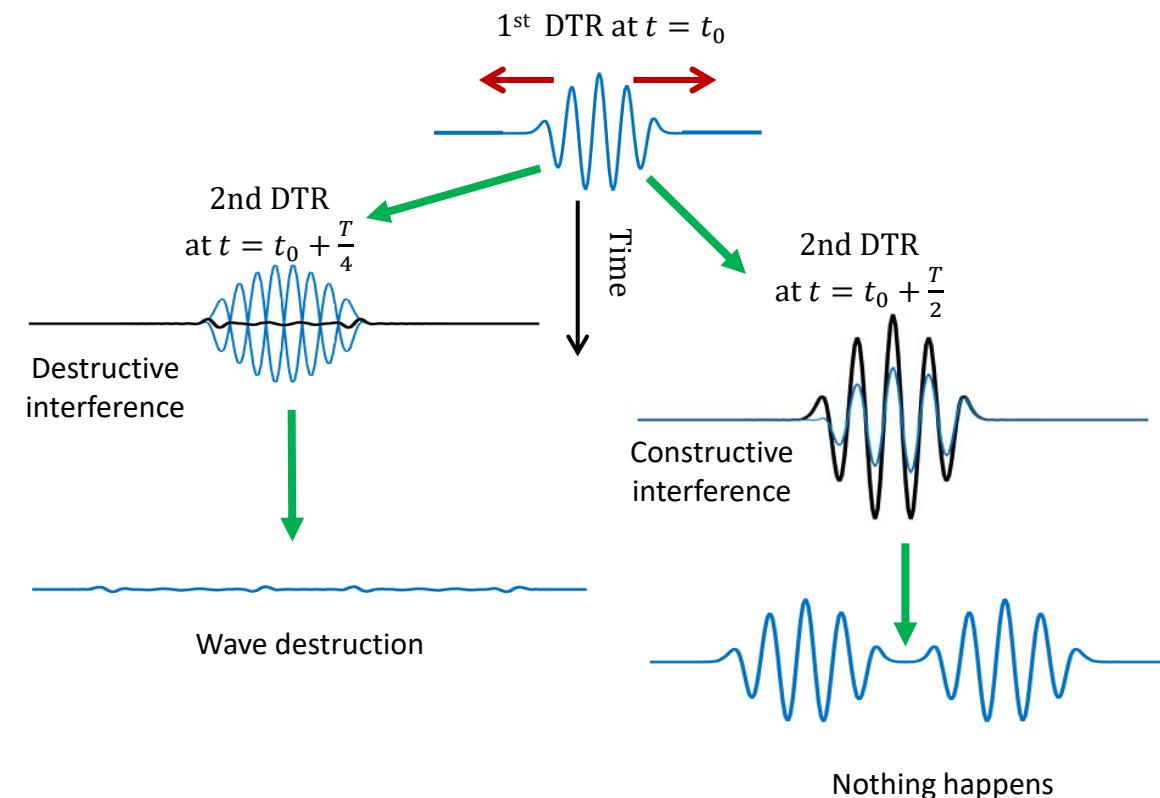
2. WAVE KILLING STRATEGY



1. EXPERIMENTAL DEMONSTRATION



2. WAVE KILLING STRATEGY



3. WAVE ENGINEERING

