

Main Title

Here Goes the Subtitle

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PennState

The Sound Innovation of Metamaterials
& Biomedical Acoustics (SIMBA) Lab

- Introduction
- Main section 1
- Main section 2
- Conclusions and future work

This is a template for the academic presentation.

Block title

- Line 1
- Line 2

Example block title

Description here

- Line 1
- Line 2

Sound fields on **front side**:

- **Near field**: second-order nonlinear or Kuznetsov equation (local effects are strong)
- **Westervelt far field**: Westervelt equation (local effects are negligible)
- **Inverse-law far field**: $p \propto 1/r$
- Proposed simple formulae for the **transition distances**

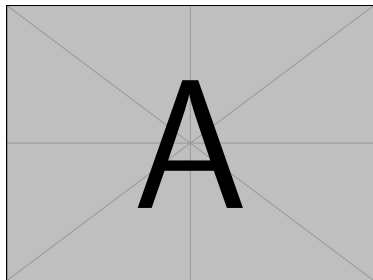


Fig 1. Captions A

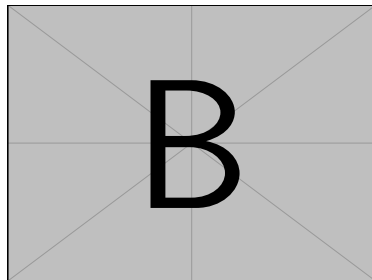


Fig 2. Captions B

Sound fields on **back side**:

- Proposed a **non-paraxial theoretical model** validated by experiments
- Audible sound behind a PAL especially at **low frequencies**

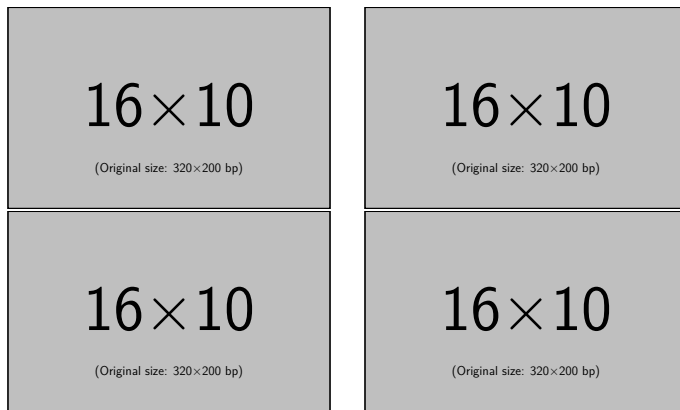


Fig 3. Example of 2x2 images

References:

- J. J. Wen et al. In: *J. Acoust. Soc. Am.* 83.5 (1988), pp. 1752–1756

Using equations

- Equation template

Existing method:
$$p(\mathbf{r}) = \iiint\iiint \cdots d^2\mathbf{r}' d^3\mathbf{r}'' \quad (1)$$

- Shading part of the equation

Proposed method:
$$p(\mathbf{r}) = \sum\sum\sum\sum \int \cdots d\mathbf{r}' \quad (2)$$

Thank you!
Any Questions?