

Introduction to FIRmaker[®] 3D

Sound system design with numerical optimization

FIRmaker 3D

- Next generation of FIR-based beam-steering
- Uses planar loudspeaker arrays or other two-dimensional arrangements
- Considers 3D layout of audience areas

- Product development involves various components

Features

3D FIR-Based Beam Shaping

Definitions:

Beam steering:

Primary control via delay, different beams interfere, little adaptation to throw distance, „point & shoot“

Beam shaping:

SPL coverage adapted to venue layout using numerical optimization of FIR filters, „tailoring“

2D beam shaping:

Considers only one (vertical) domain, requires linear array of loudspeakers

3D beam shaping:

Considers also horizontal domain, requires 2D array of loudspeakers

3D FIR-Based Beam Shaping

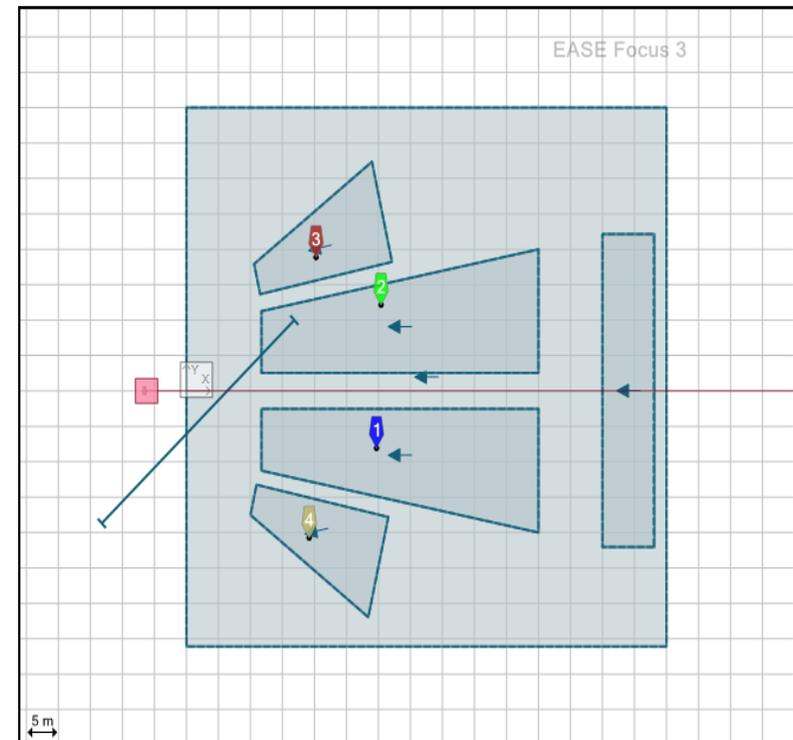
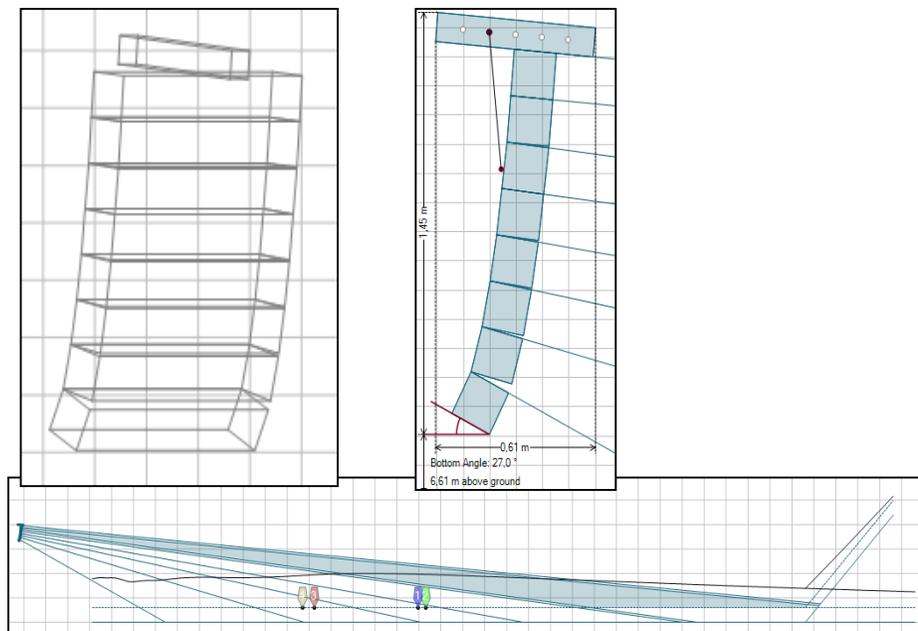
3D beam shaping examples:

- Dynamic horizontal beam width
- Asymmetrical venue layouts
- Trapezoidal shapes of audience areas
- Avoiding distribution of sound to the back or side walls
- Point & shoot in 3D
- Different audio channels for different zones of a space

3D FIR-Based Beam Shaping

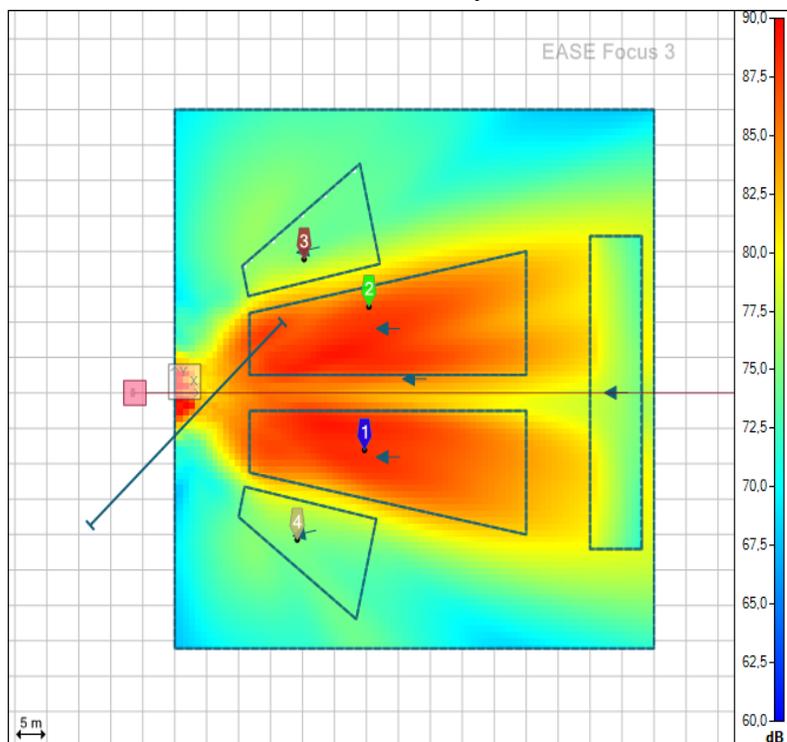
Example:

8 x 8 array, coverage optimized by FIRmaker 3D

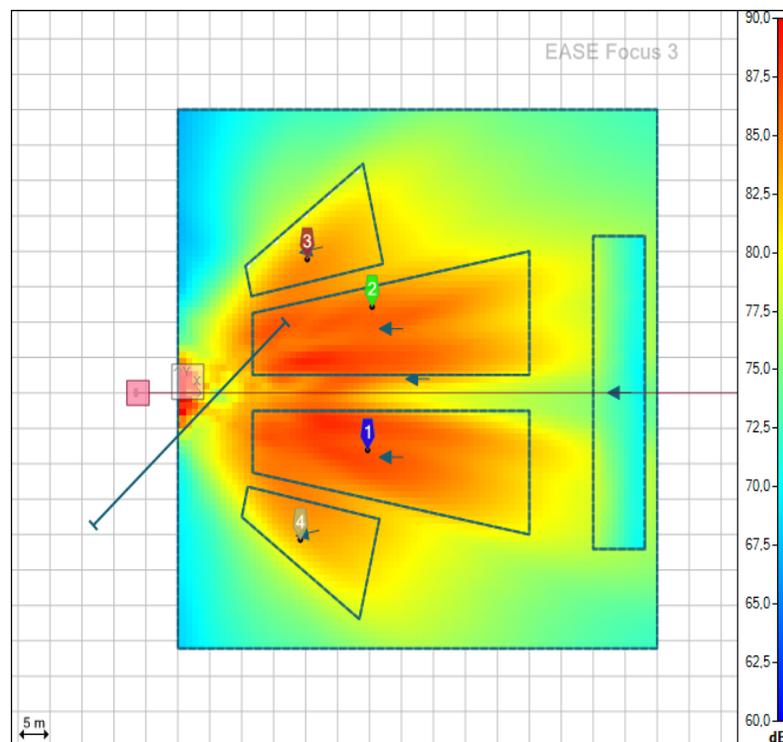


3D FIR-Based Beam Shaping

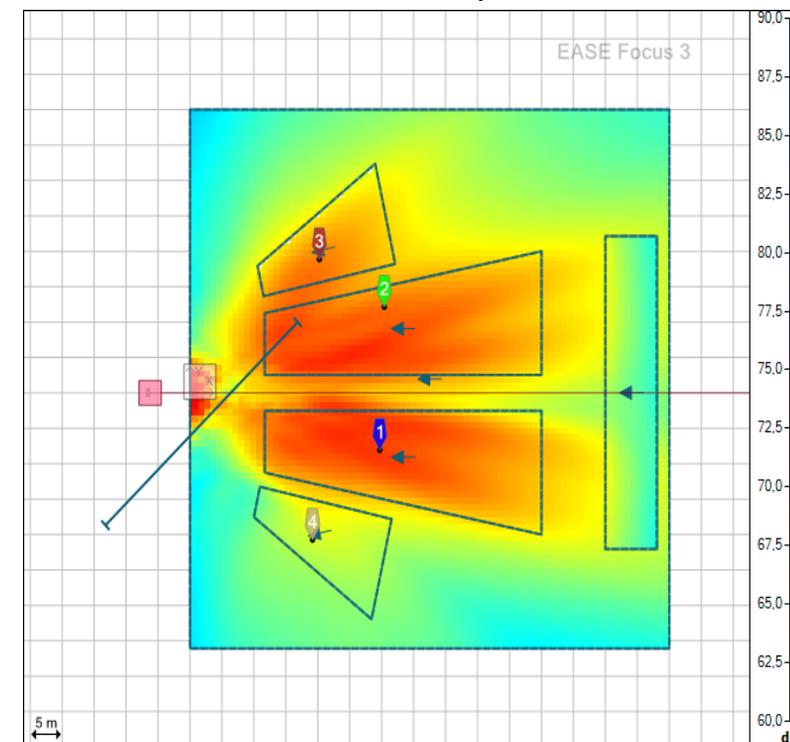
Main Only



Include All



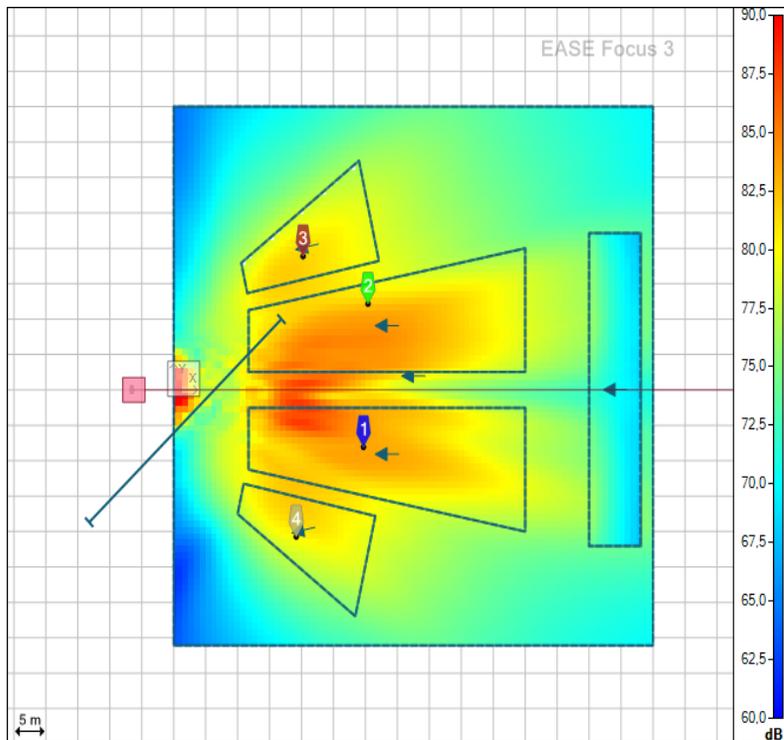
Left Only



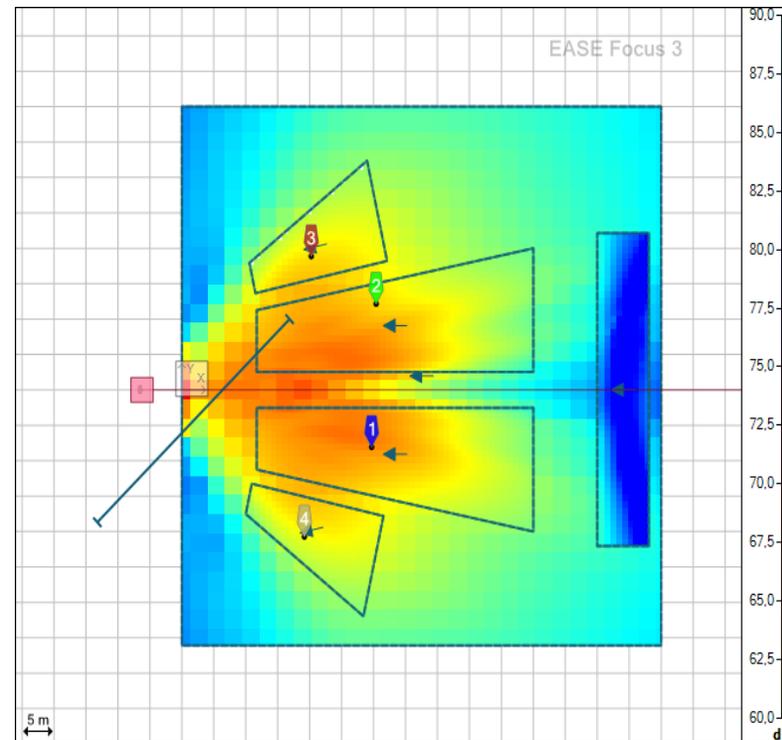
*Frequency Range: 500 Hz – 4 kHz

3D FIR-Based Beam Shaping

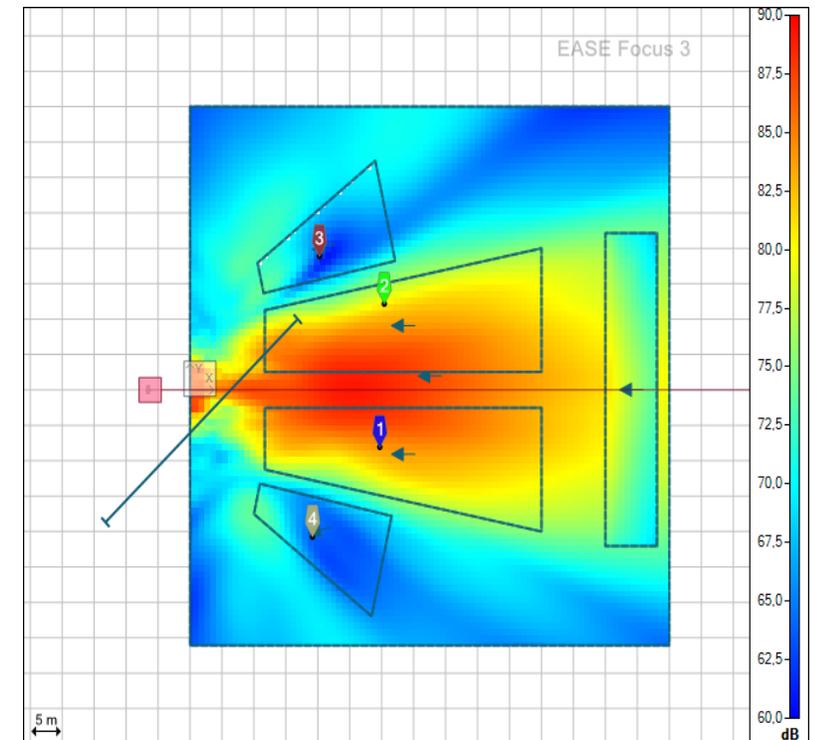
Avoid Back Wall



Avoid Back Wall Strongly



Avoid Side Walls



*Frequency Range: 500 Hz – 4 kHz

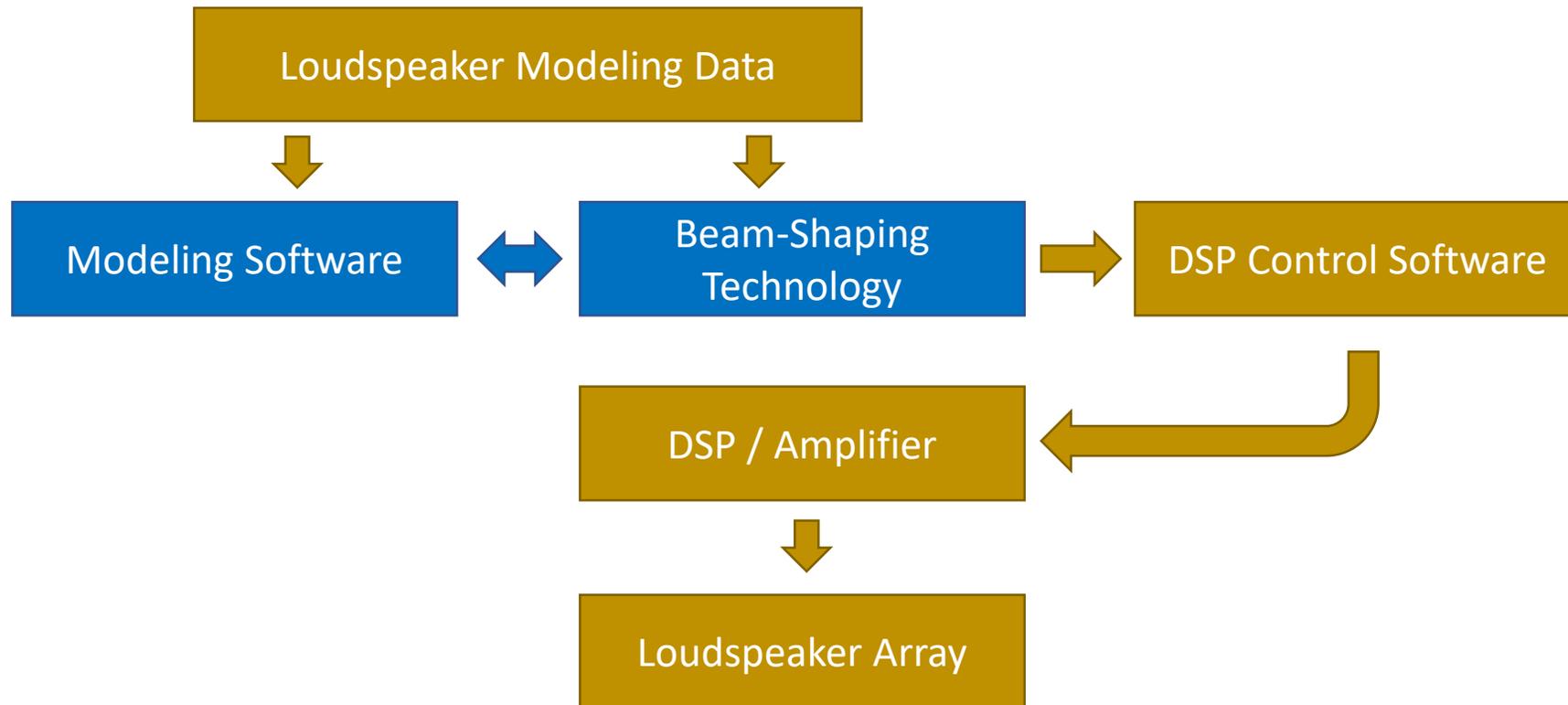
3D FIR-Based Beam Shaping

Related application scenarios for 2D arrays:

- Localizing/tracking sources on the stage
- Different channels, e.g. stereo
- Channel-based room excitation, e.g. speech vs music
- 3D sound effects
- Interactive experiences, tracking moving listeners

Required Components for Product Development

Required Components



Solutions Available from AFMG

Purchase Options

AFMG® distributes its software directly, worldwide.

Contact the **AFMG Sales Team** via Email

Thank you for your attention!

AFMG Sales Team

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