



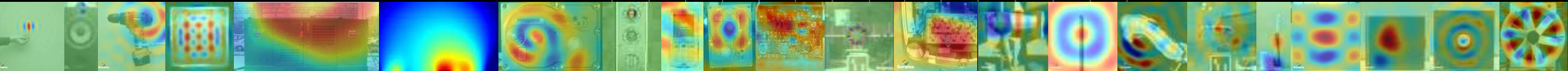
Sorama

visualising sound and vibrations



Sorama

visualising sound and vibrations



How valuable is sound vision?

From sound vision to sound design



Sorama

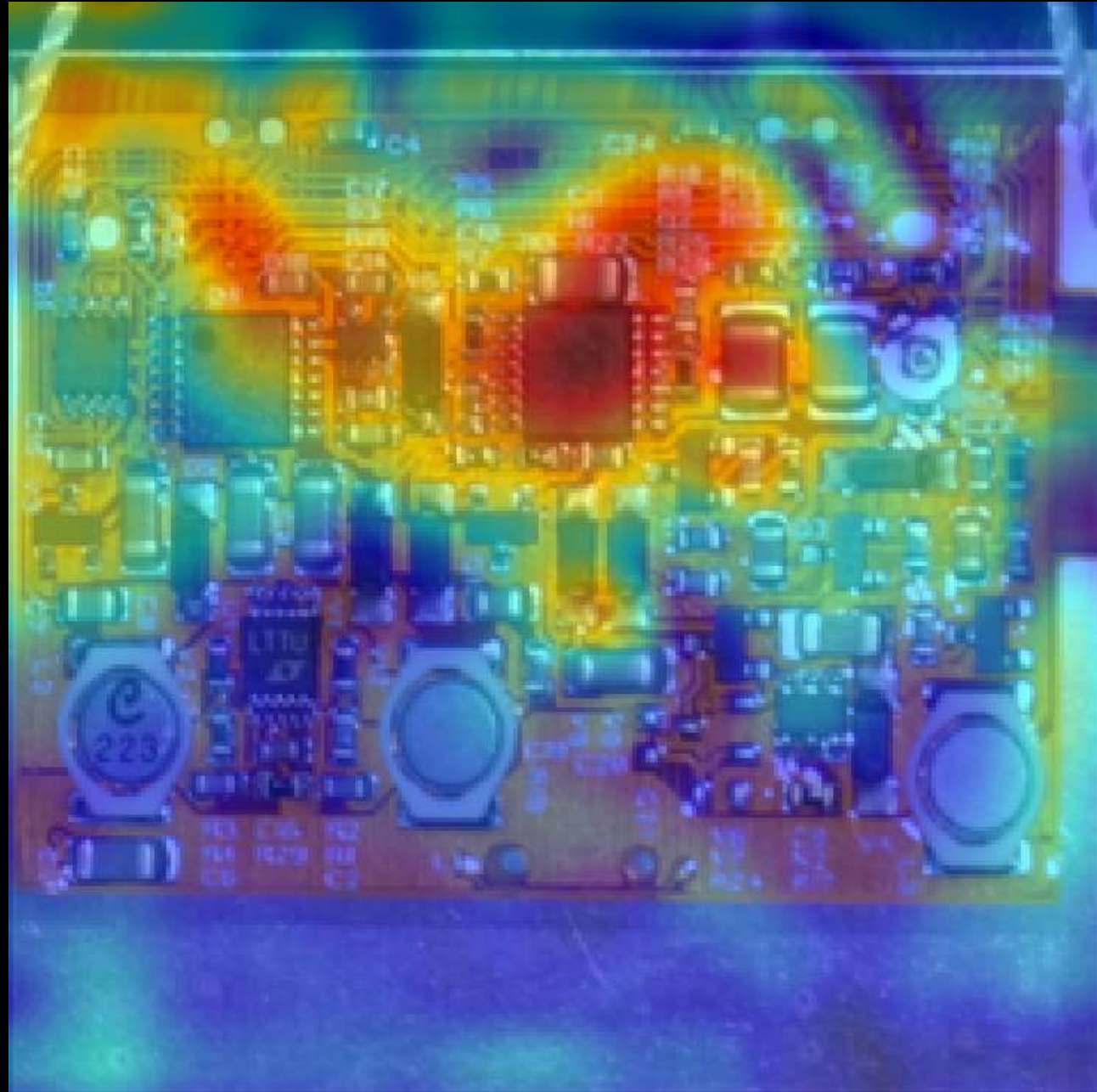
Sonus Orama

Sound Vision

Sound Vision

Make the ~~World~~ **> 1.000.000** Sound Right

13.000 Hz



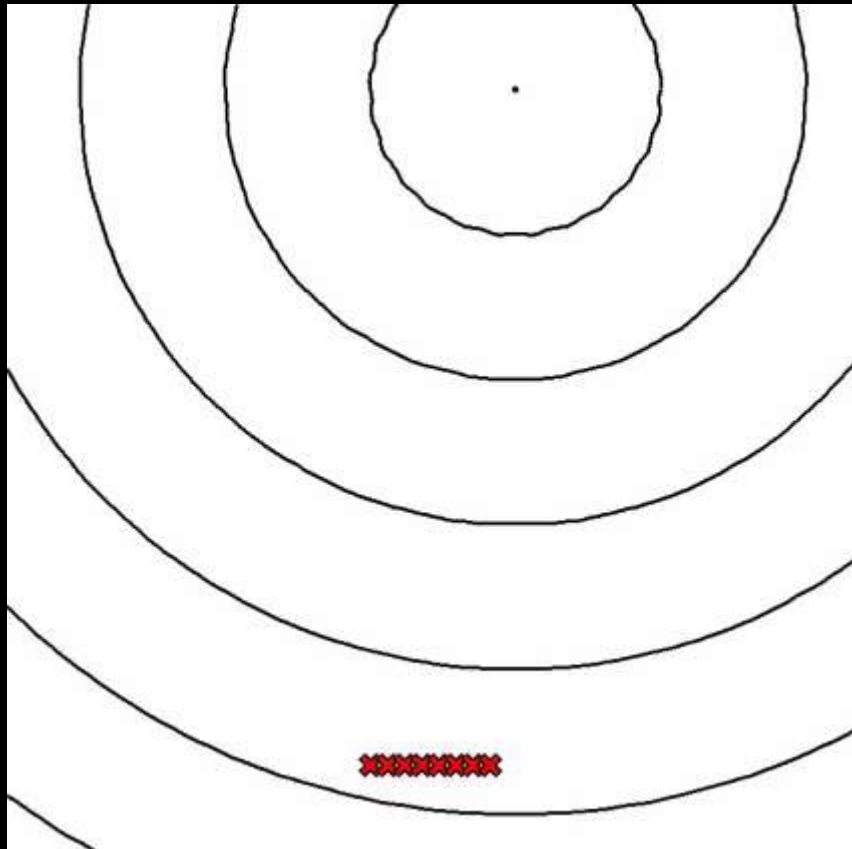
50.000x
delayed

(Source: Philips)

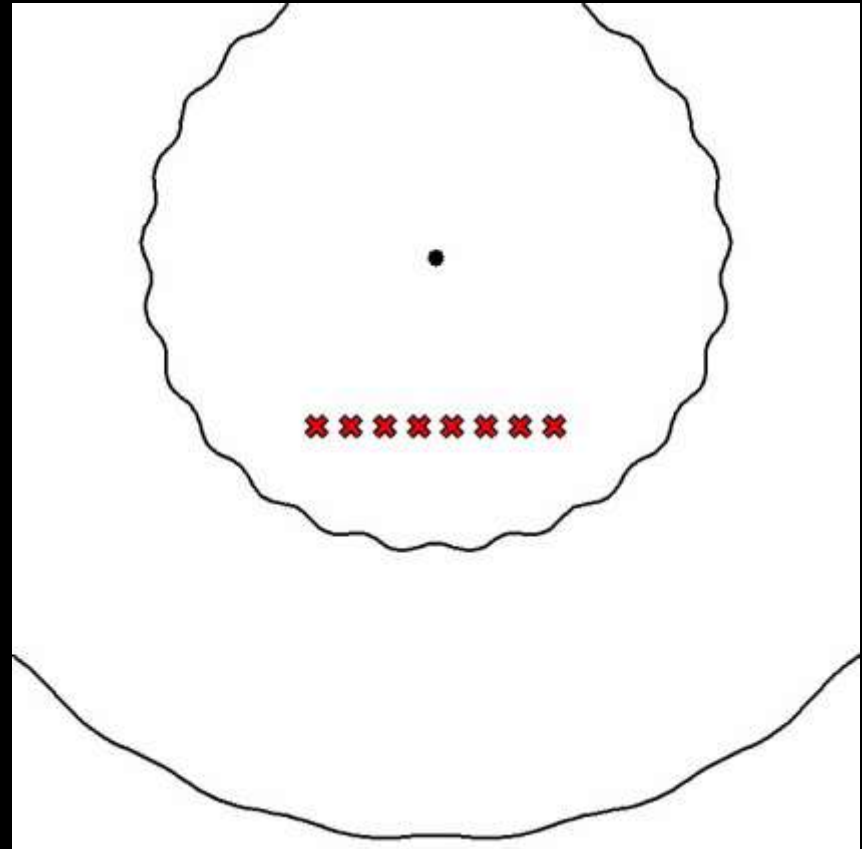
Acoustic Waves



Far-field

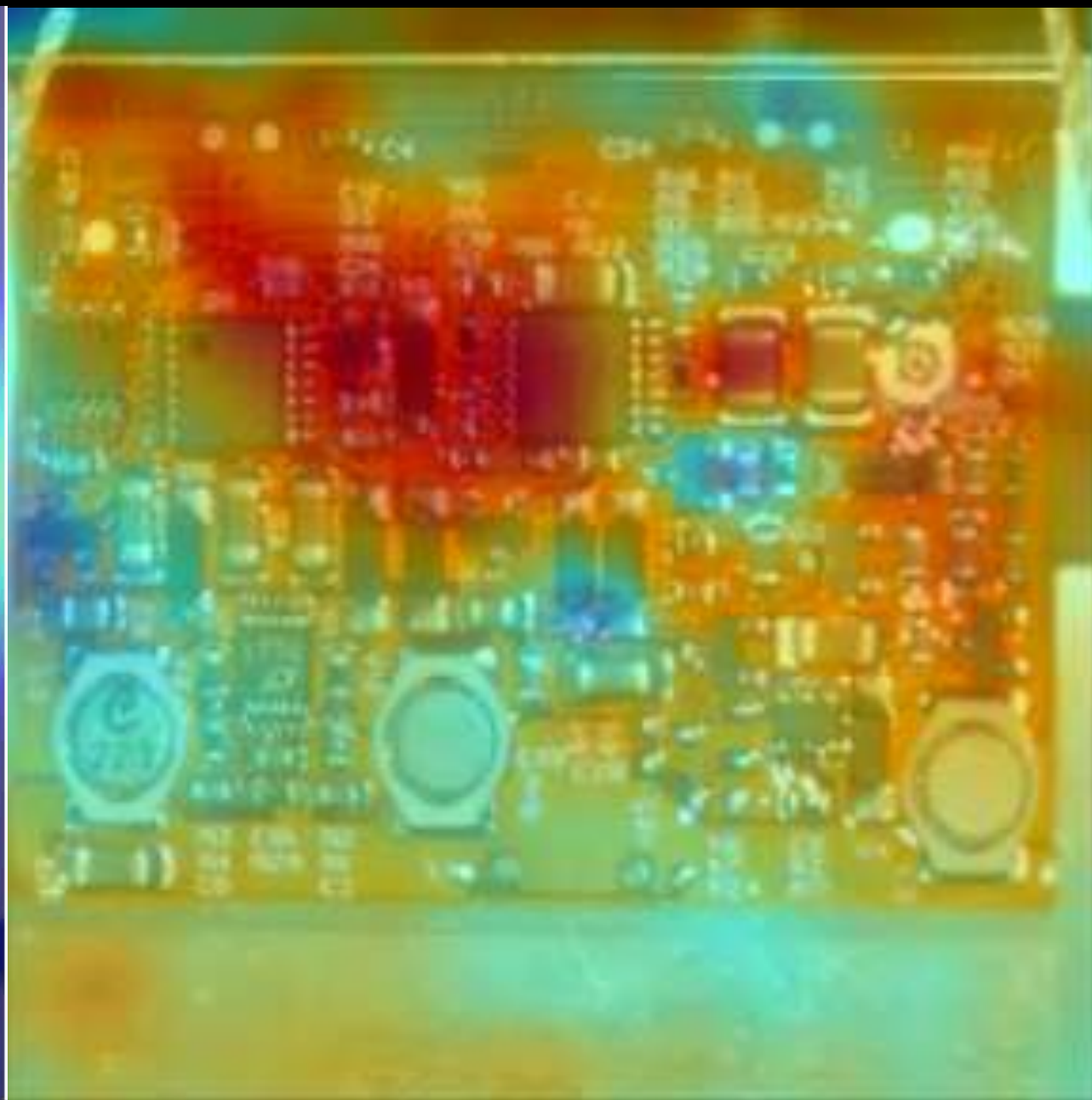


Near-field





Far field localization



Near-field observation and insight

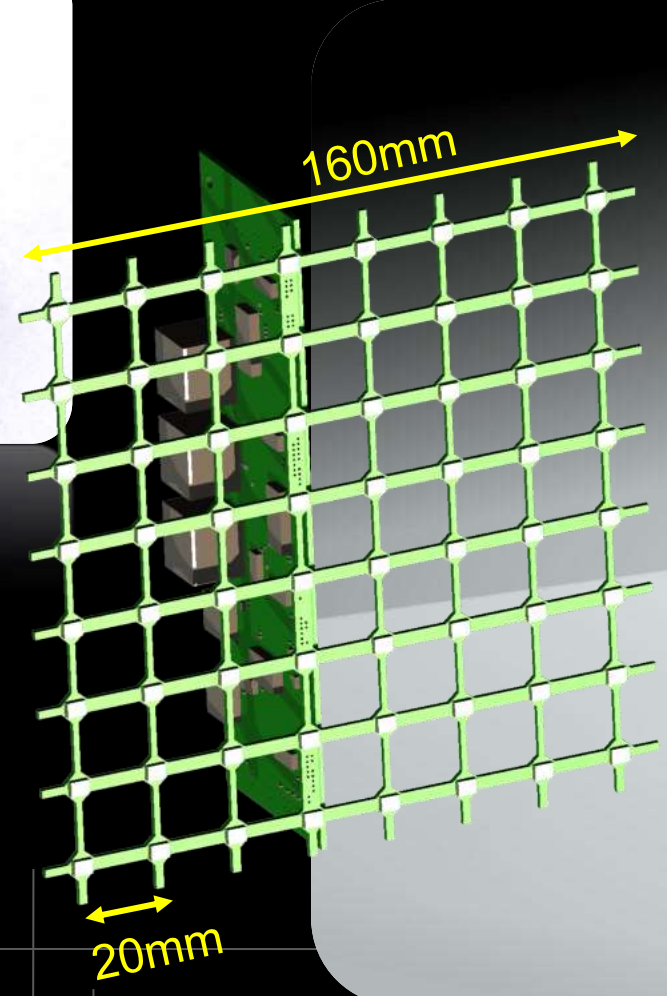
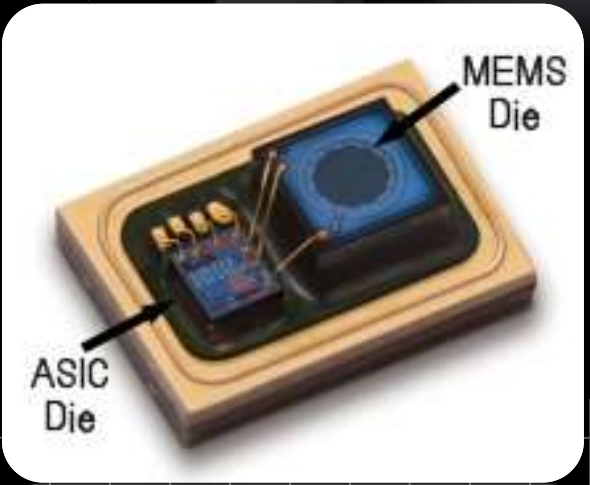
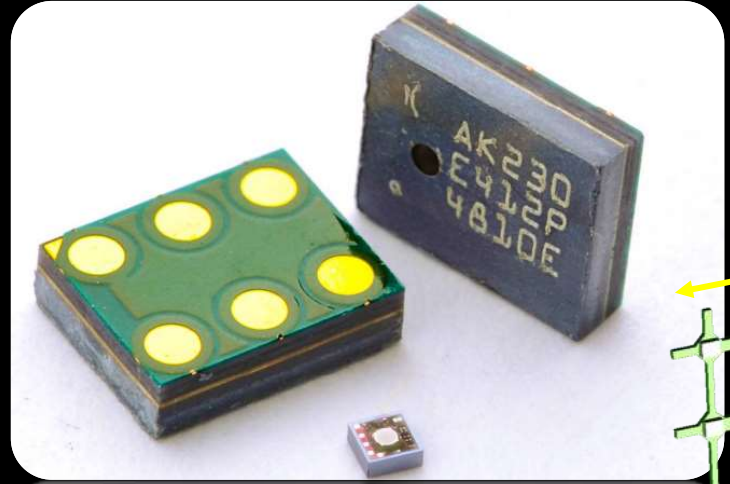
(Source: Philips)

Digital MEMS microphone array

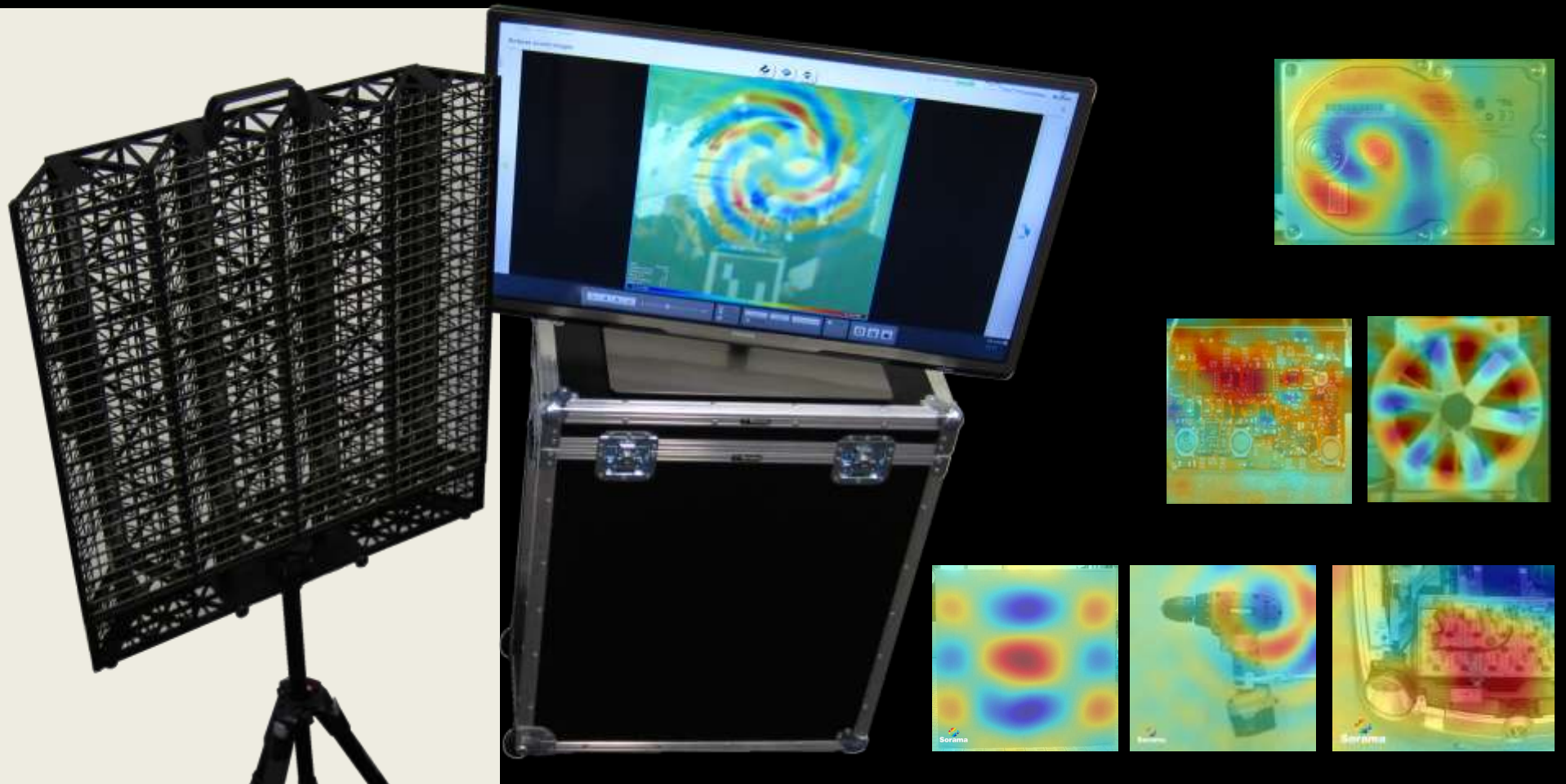
64-1024 multiplexed channels



Monolithic CMOS MEMS Microphone Chip



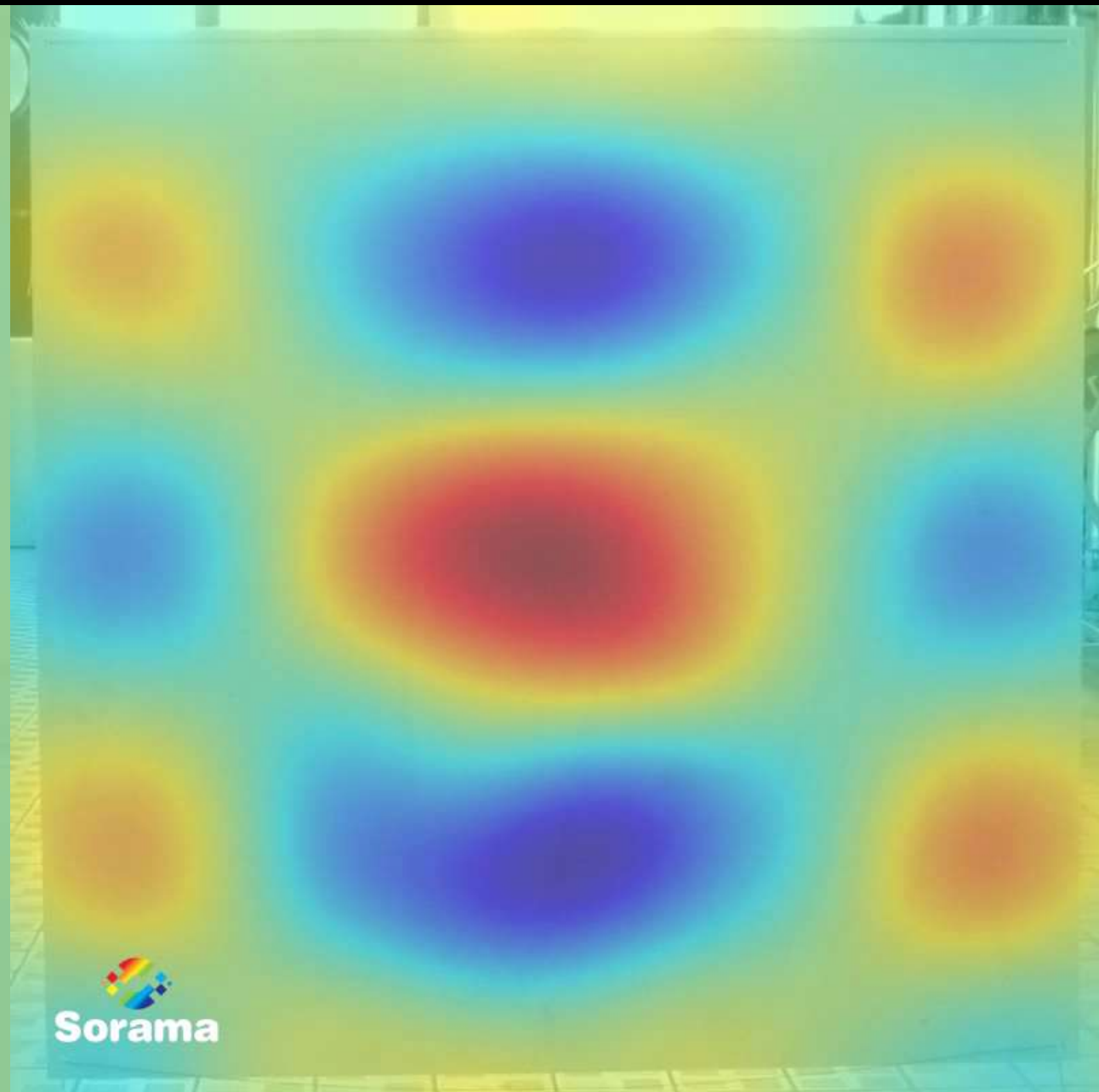
Sound Camera






Sorama

Tuning fork in open air




Sorama

Tuning fork on wooden plank

Solar Team Eindhoven Sorama Sound Imaging



72 Hz



Solar Team Eindhoven Sorama Sound Imaging



521 Hz



Solar Team Eindhoven Sorama Sound Imaging



4044 Hz



Solar Team Eindhoven Sorama Sound Imaging

19991 Hz



Analyse

Exit

Reset view



Type: PressureProjection
Frequency [Hz]: 19991
Phase [°]: 150
CutOff [rad/m]: 157.1
Slope [-]: 0.00
Selected layer distance [mm]: 0.00

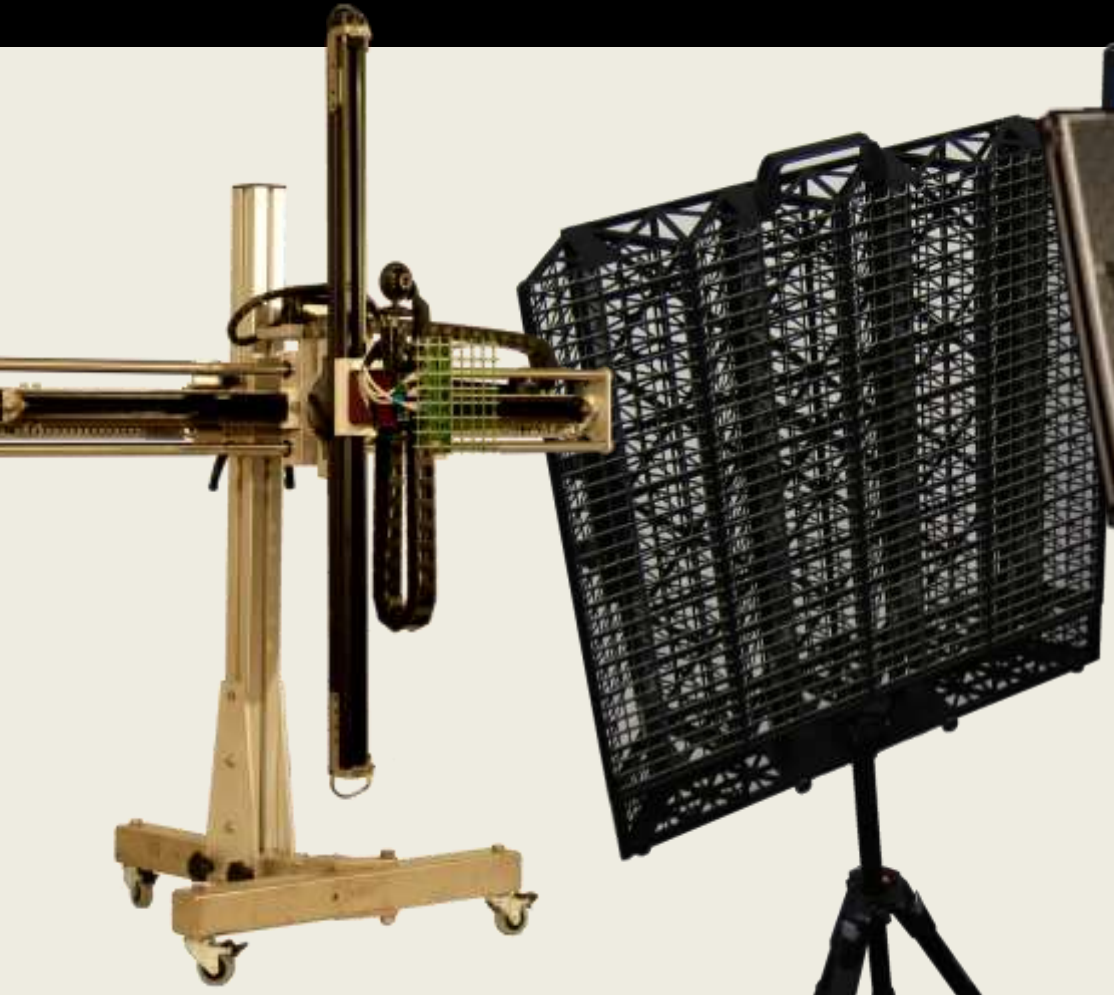
-5.44e-3

5.44e-3

Sorama Front-ends



Sorama Scan A
Awarded "Best Idea
Electronics&Automation 2011"



Sorama Cam
Awarded "High Tech NL
Award 2013"

Sorama Scan B
High-res system used by
NXP Semiconductors



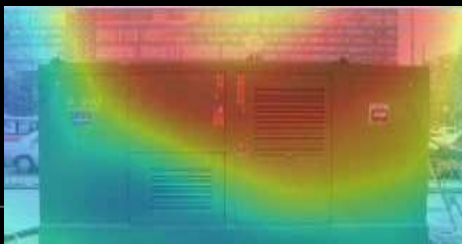
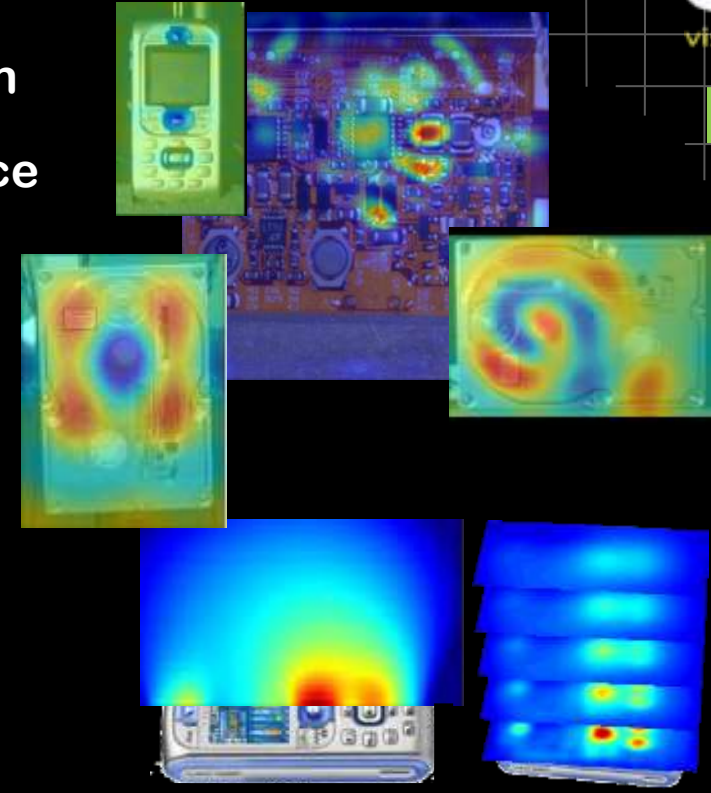
Sorama Scan M
Manual step-in
model used by Remeha
and Bureau Geluid



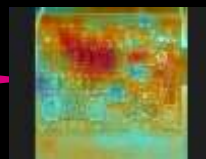
Sound Imaging Analysis



- Sound source identification & location
- Sound source behavior in time & space
- 3D sound propagation
- Structural vibration analysis
- One Hologram results in:
 - 3D** Sound Pressure
 - Particle Velocity
 - Sound Intensity
- over a desired frequency band



large product range



The background of the slide is a dark field filled with numerous small, overlapping spectrograms. These spectrograms are colorful, showing various patterns of sound frequencies over time in shades of blue, purple, red, and yellow.

Sound Design
Observe
Gain Insight
Understand



Sorama

visualising sound and vibrations

Make the World Sound Right