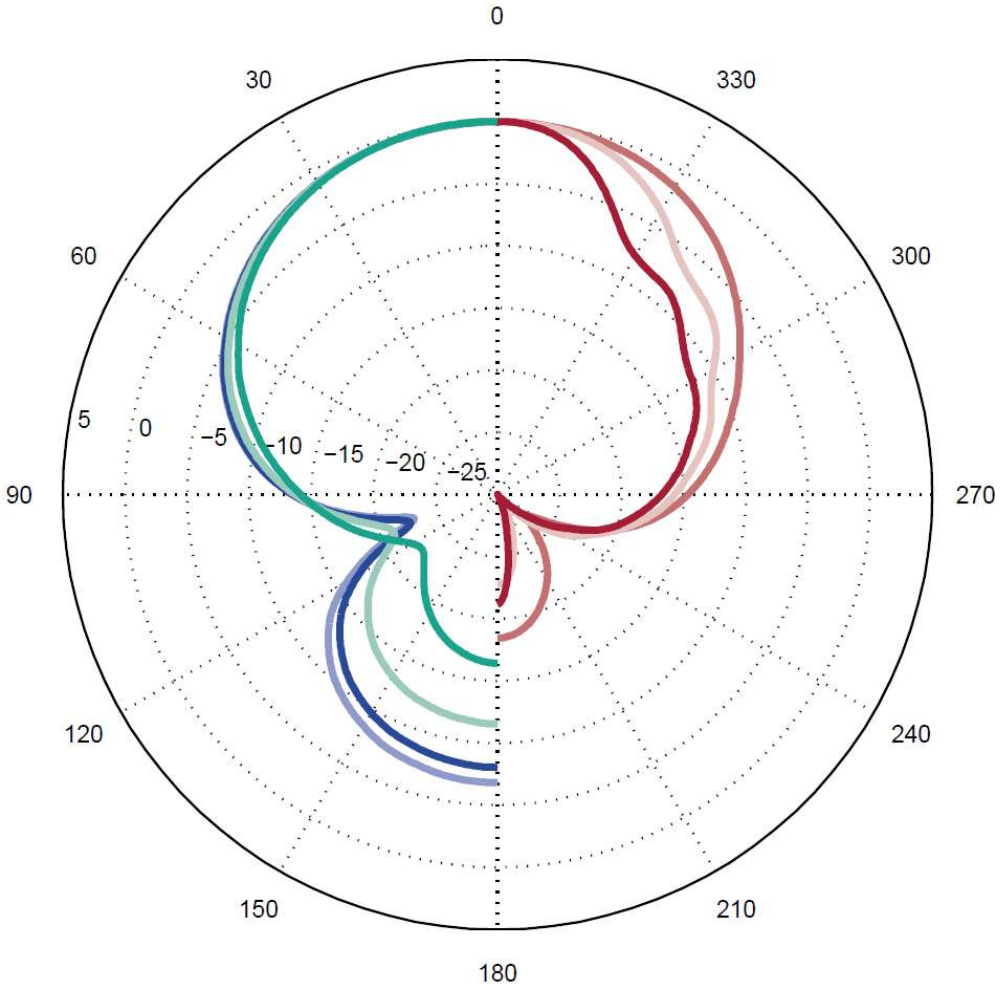
Directivity



SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

Polar diagram etc.

Diffuse field

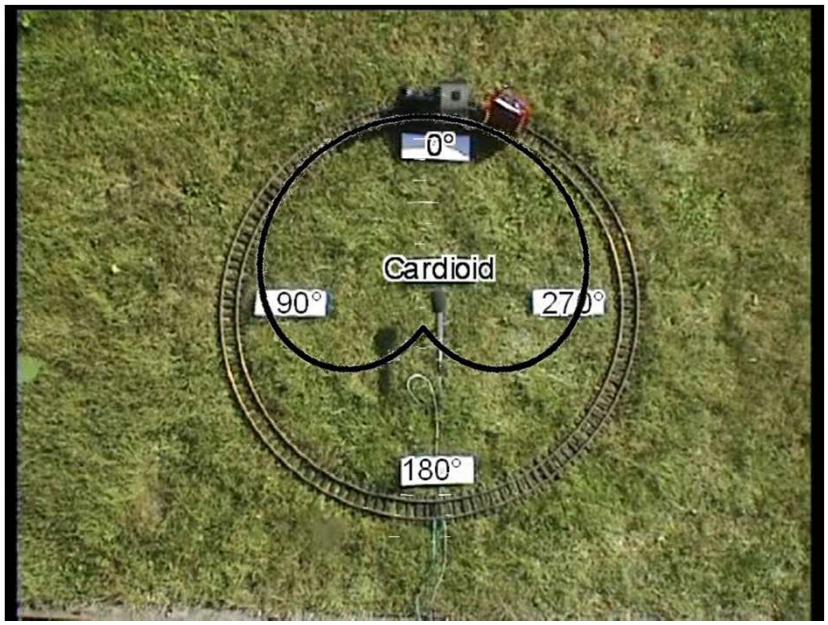
Interference tube

Higher order

- For a directional microphone, the level depends on the …

  …**direction** of the sound incidence

  …**frequency**



Ref: Jörg Wuttke

SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

Polar diagram etc.

Diffuse field

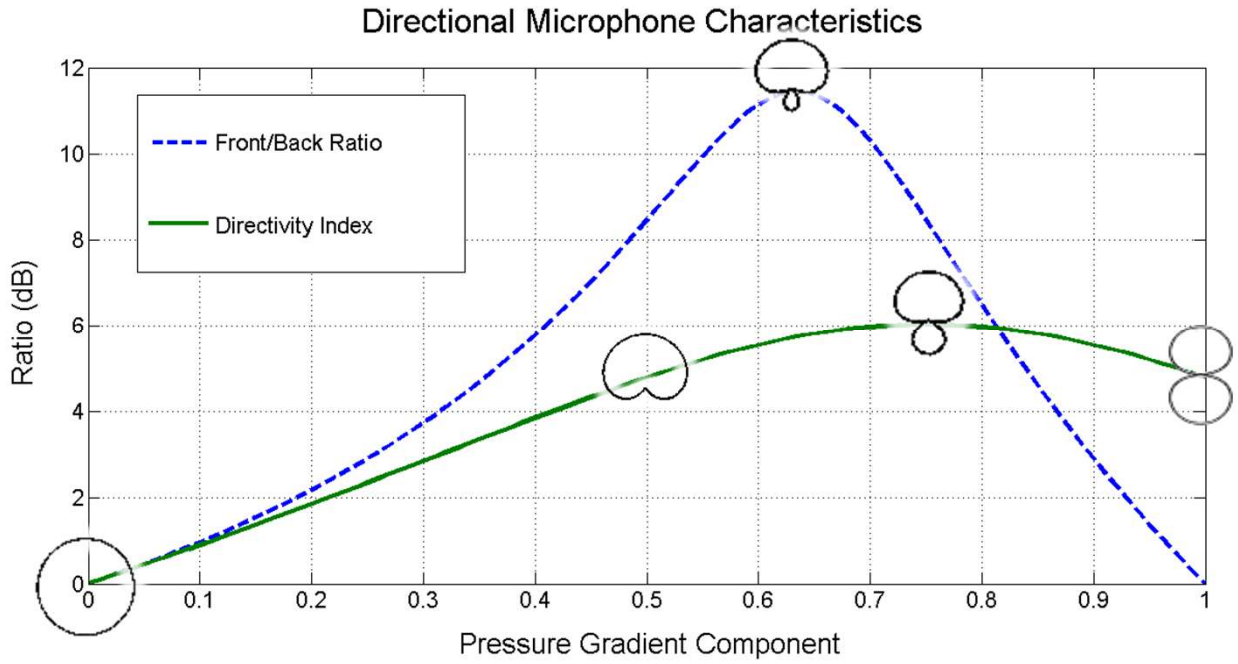
Interference tube

Higher order

- Why directional microphones?
  - Avoid **crosstalk** (leakage) from undesired sound sources
  - Reduce level of **reverb** and **room noise** (diffuse field)
  - Increase "**reach**" = acceptable distance between microphone and sound source
  - Apply **level difference stereophony**
  - Create **proximity effect**

SCHOEPS Mikrofone

- Directivity



SCHOEPS Mikrofone

Directivity

Why?

Front to some-where else ratios

Distance factor

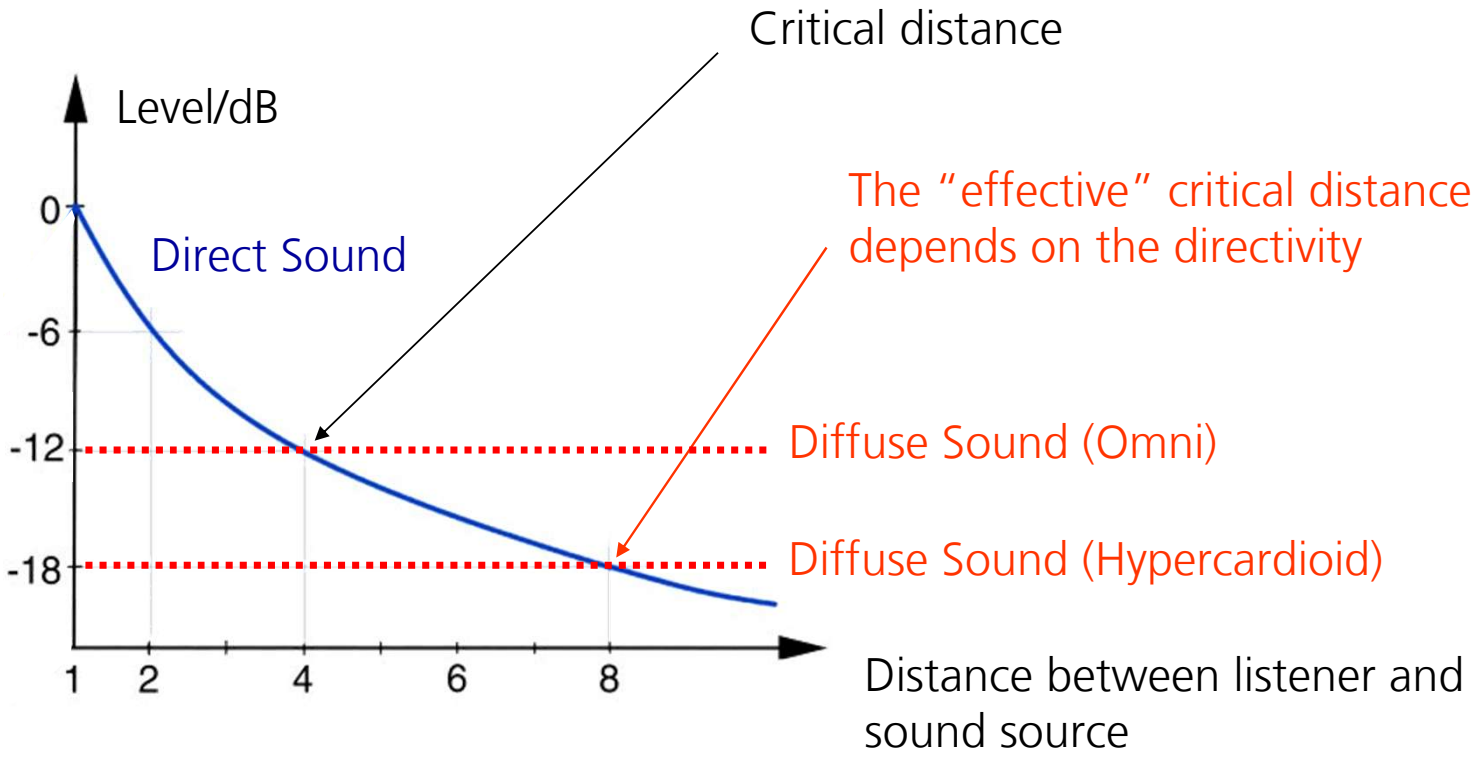
Polar diagram etc.

Diffuse field

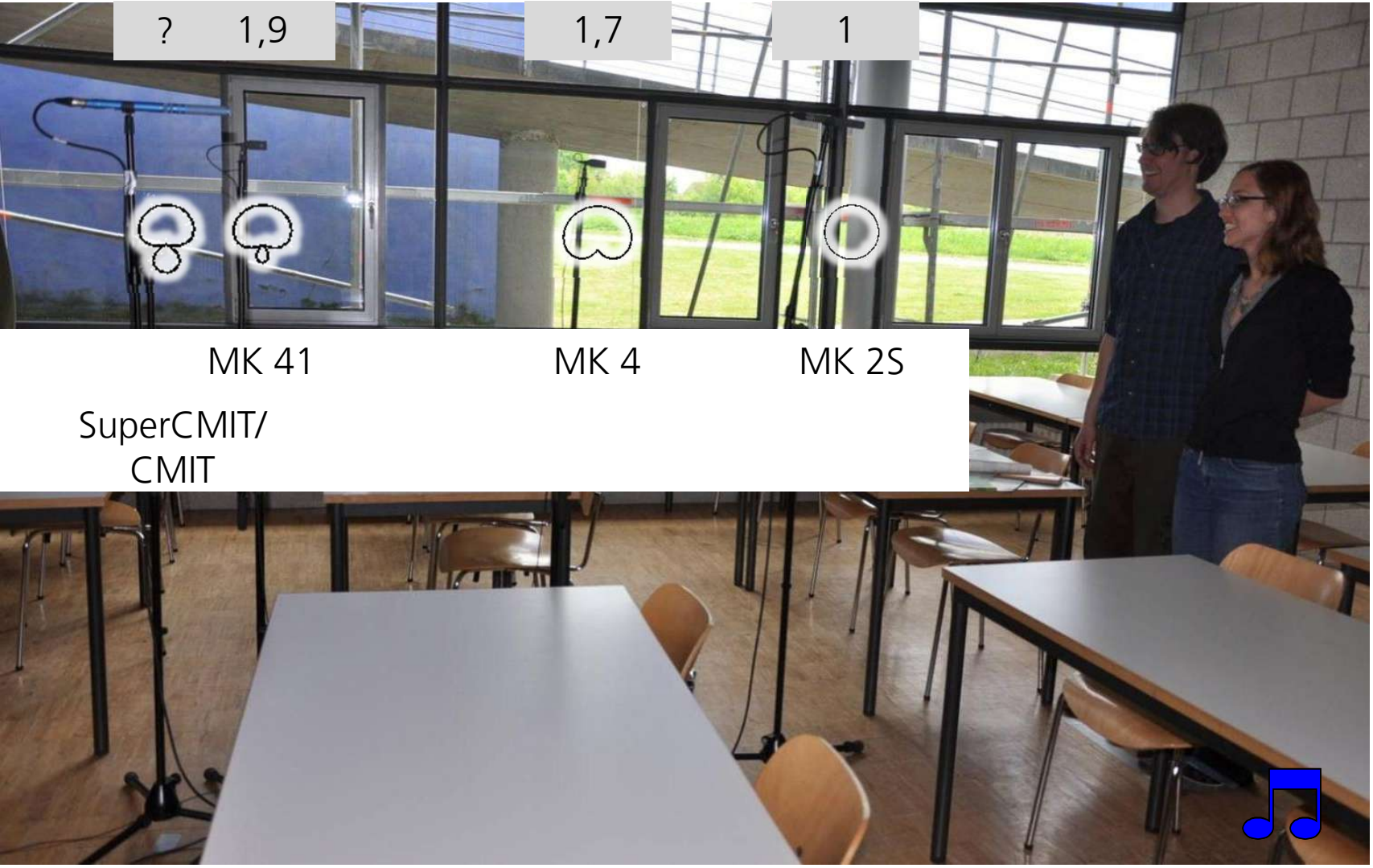
Interference tube

Higher order

- Direct sound/ Diffuse sound



- Distance factor



SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

Polar diagram etc.

Diffuse field

Interference tube

Higher order

- Distance factor

SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

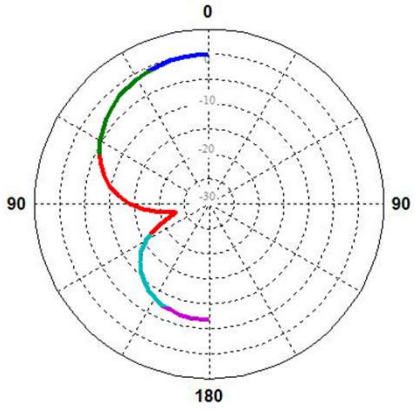
Polar diagram etc.

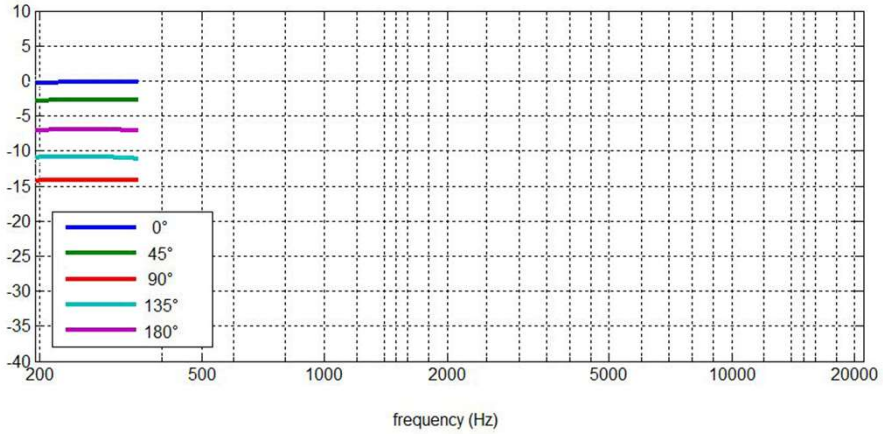
Diffuse field

Interference tube

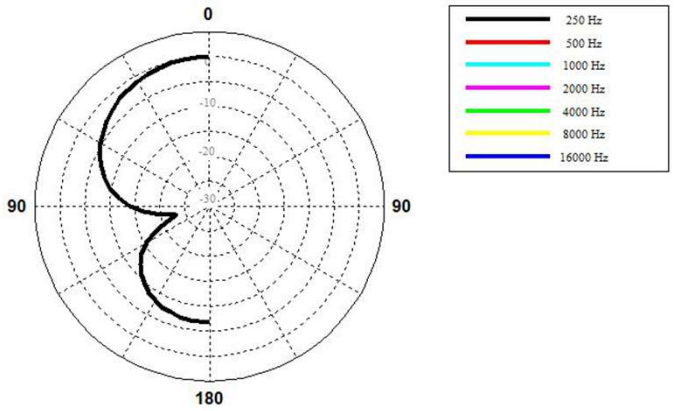
Higher order

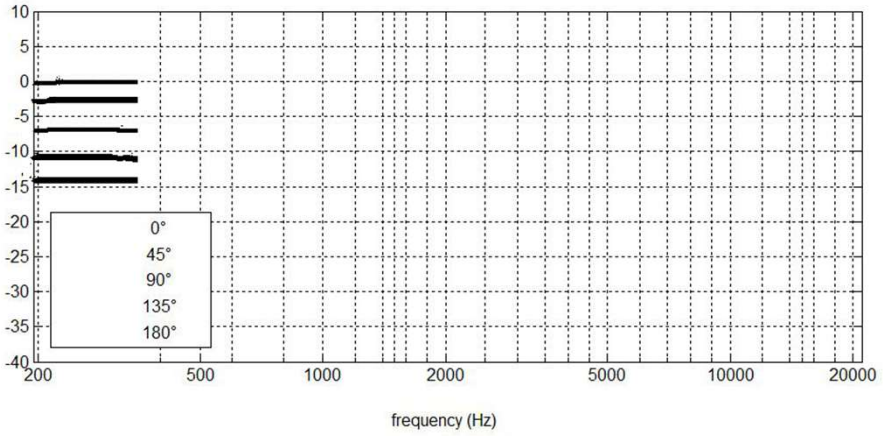
- Polar pattern vs. directional frequency response curves





- Polar pattern vs. directional frequency response curves





SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

Polar diagram etc.

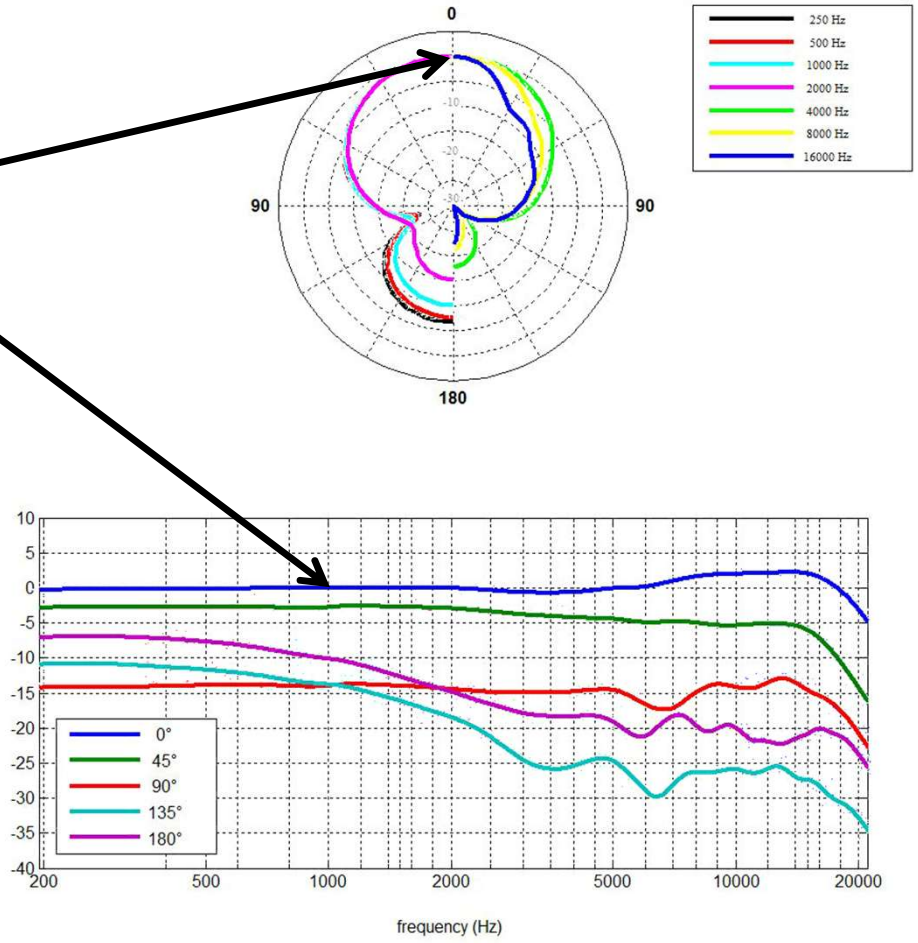
Diffuse field

Interference tube

Higher order

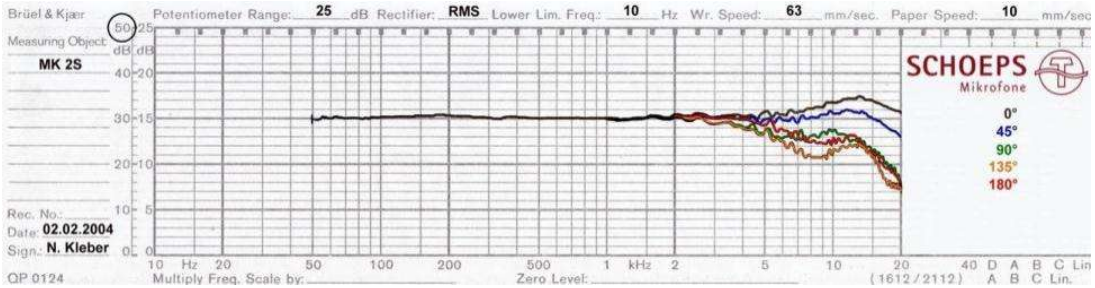
- Polar pattern vs. directional frequency response curves

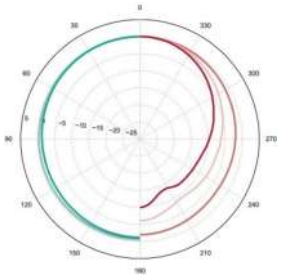
- Normalization

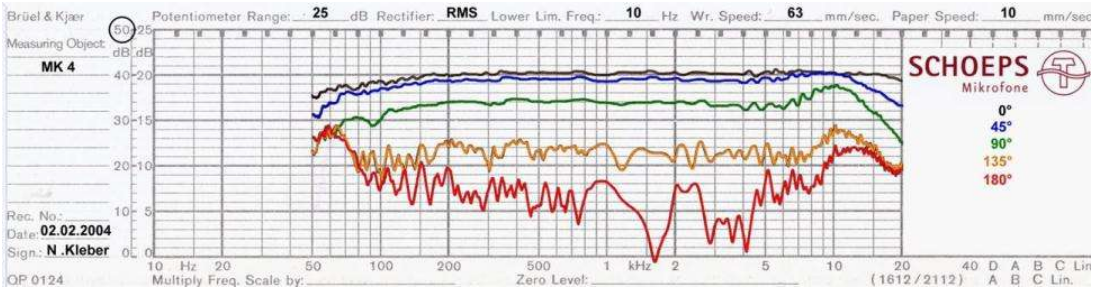


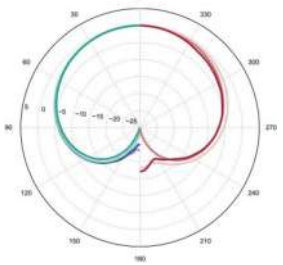
SCHOEPS Mikrofone

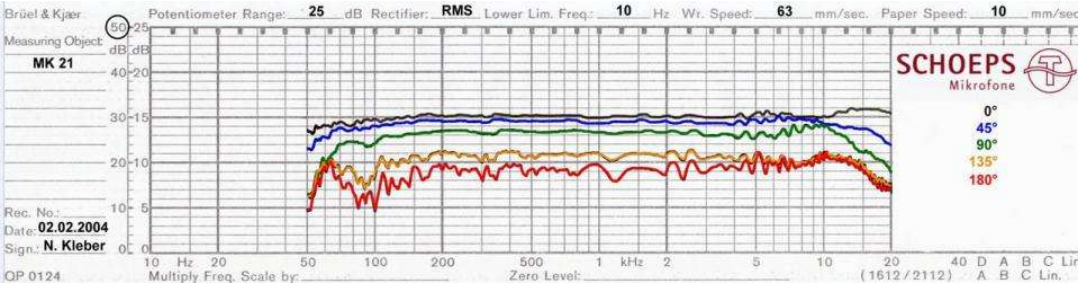
- Off-axis:

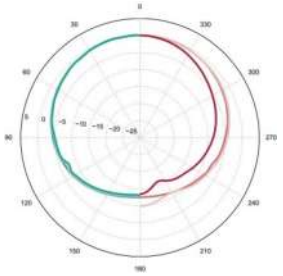












SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

Polar diagram etc.

Diffuse field

Interference tube

Higher order

- Cardioid at **0°, 90°, 180°**

➢ Microphone 1

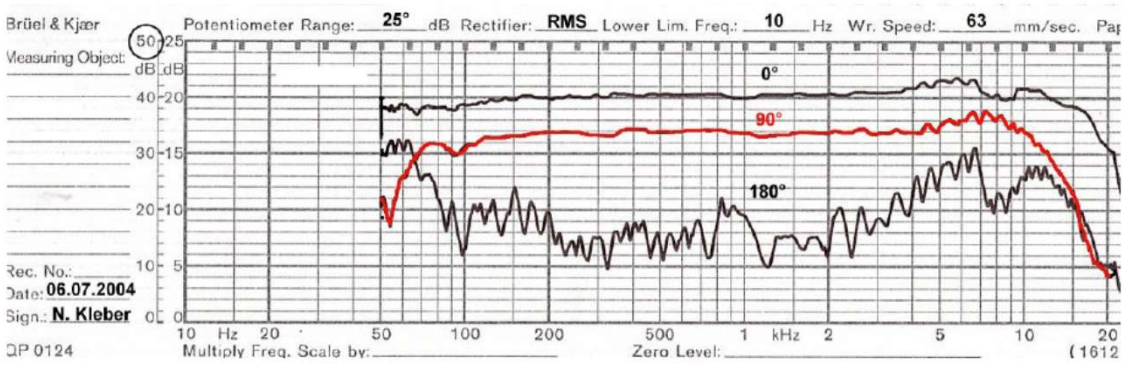


Abb. 13: Freifeld Frequenzgänge Mikrofon 1

➢ Microphone 2

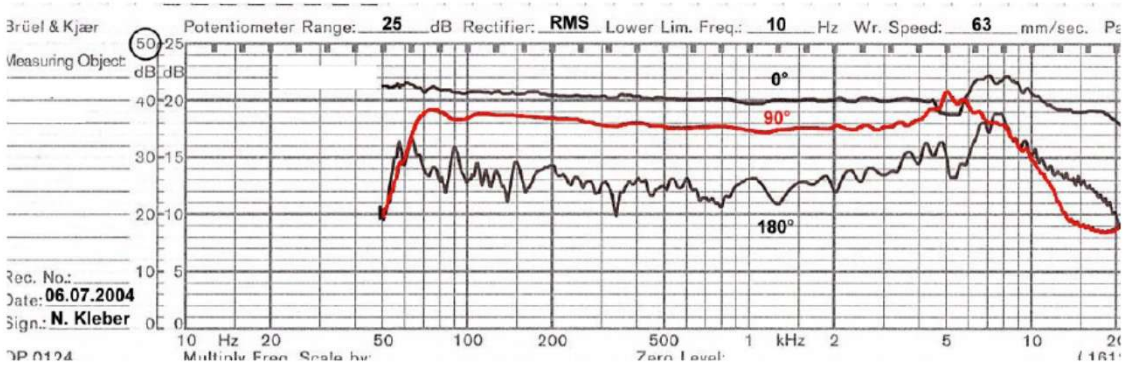


Abb. 14: Freifeld Frequenzgänge Mikrofon 2

SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

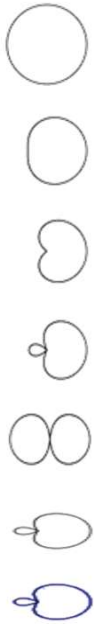
Polar diagram etc.

Diffuse field

Interference tube

Higher order

- Diffuse Field



- Omni
- Wide Cardioid
- Cardioid
- Supercardioid
- Figure-8
- Shotgun
- „Super“-shotgun

Demo: ORF Richtmikrofone

- (Half) Supercardioid on boundary layer

SCHOEPS Mikrofone

- Diffuse field-frequency response

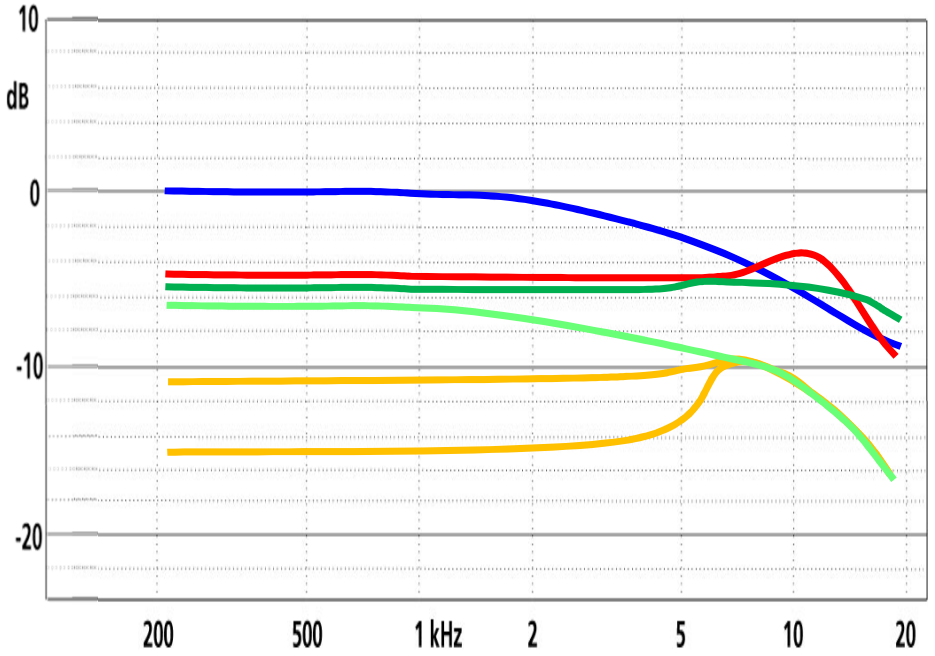
Omni MK 2

Cardioid MK 4

Supercardioid MK 41

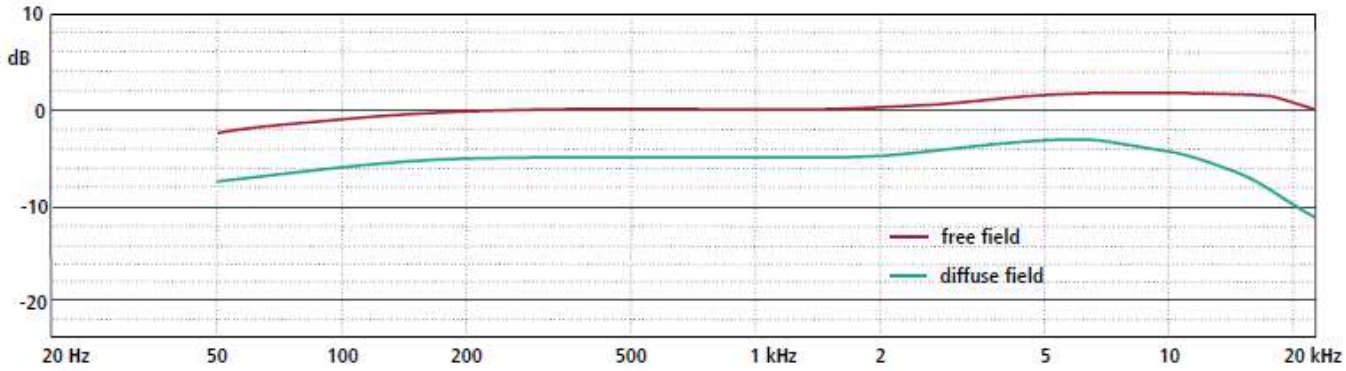
Shotgun CMIT 5

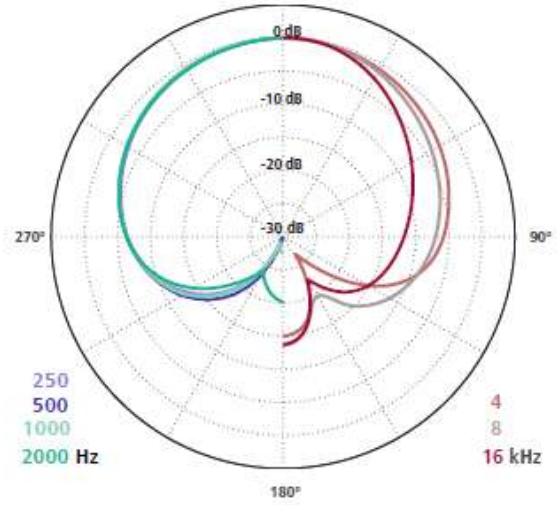
Shotgun 2nd order SuperCMIT



SCHOEPS Mikrofone

- Diffuse field-frequency response (Cardioid V4)





SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

Polar diagram etc.

Diffuse field

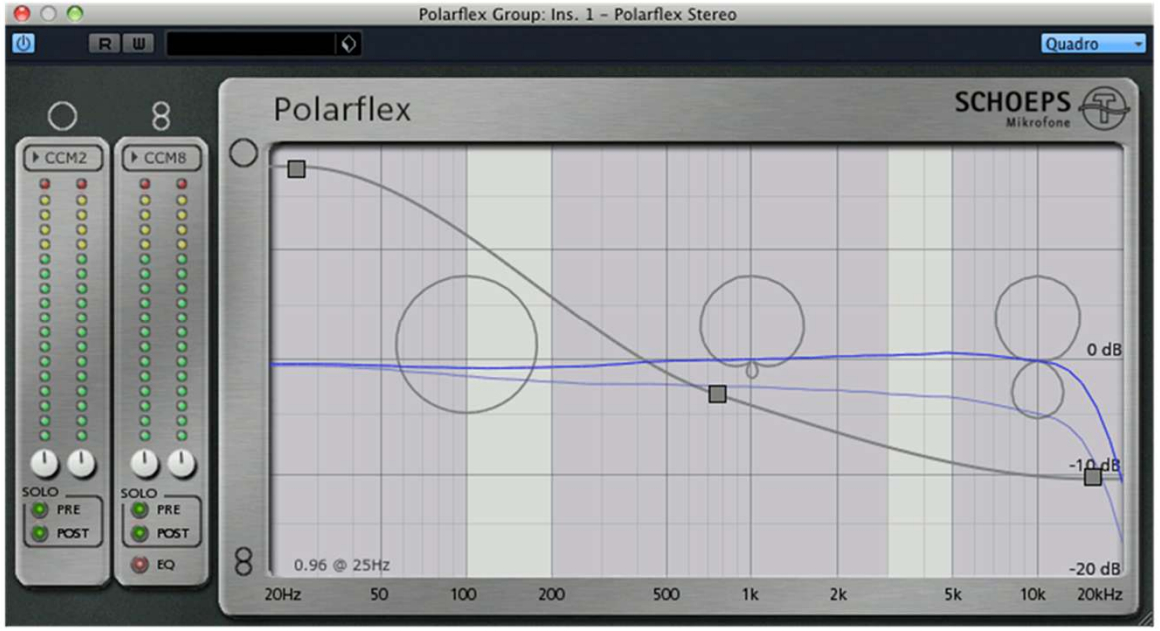
Interference tube

Higher order

- Variable Diffuse field

e.g. Polarflex technique

- Mix Omni and Fig-8 in three frequency bands
- Variation of the diffuse field response



SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

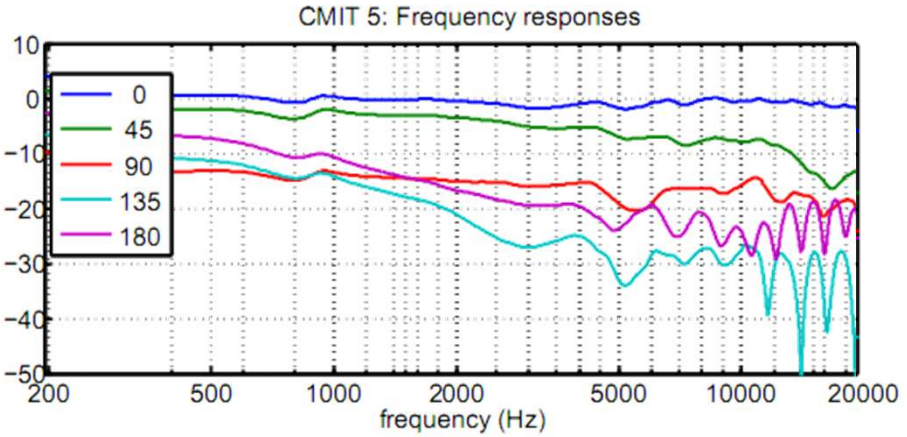
Polar diagram etc.

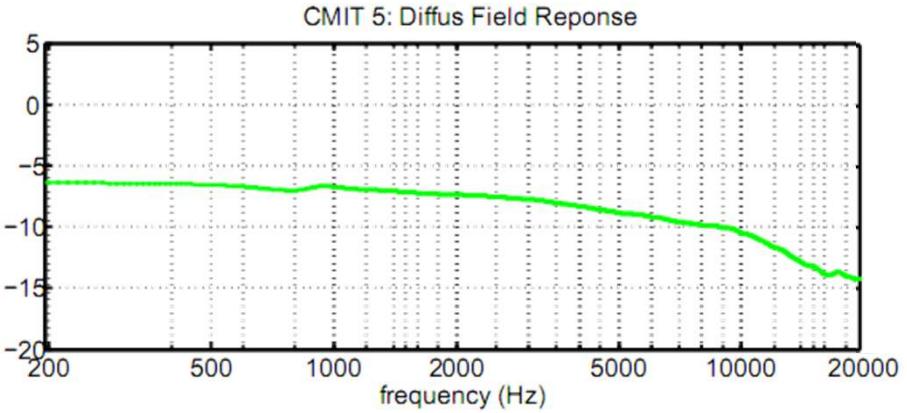
Diffuse field

Interference tube

Higher order

- Shotgun / Interference tube





SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

Polar diagram etc.

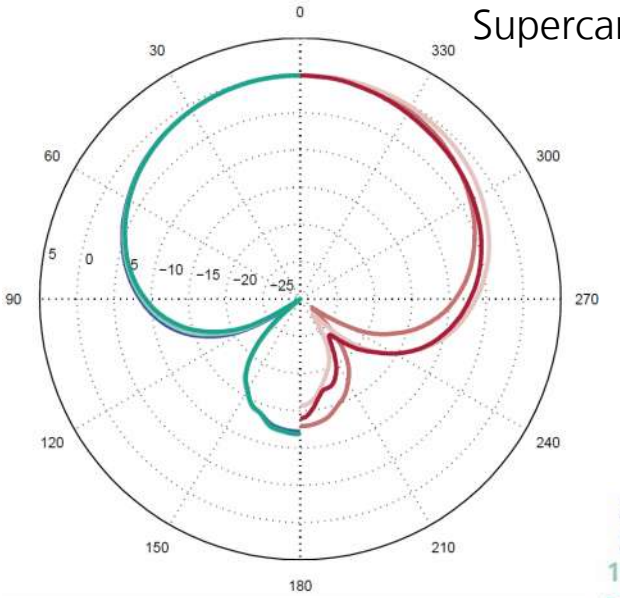
Diffuse field

Interference tube

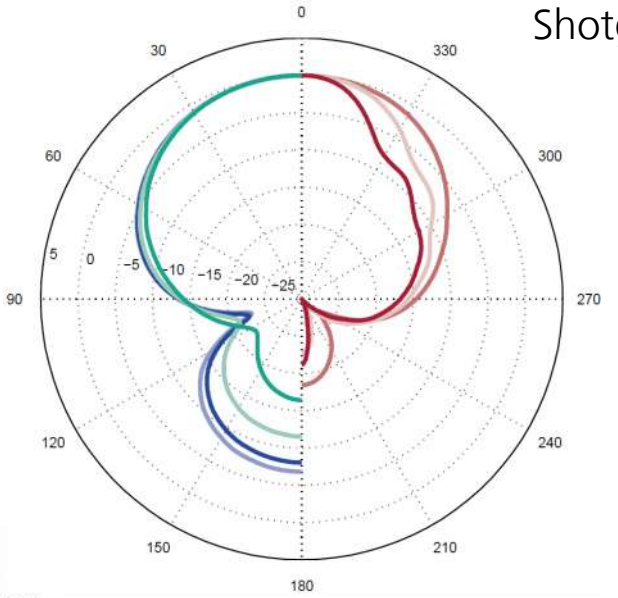
Higher order

- Shotgun or Supercardioid?

Supercardioid



Shotgun



250
500
1000
2000 Hz

4
8
16 kHz

SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

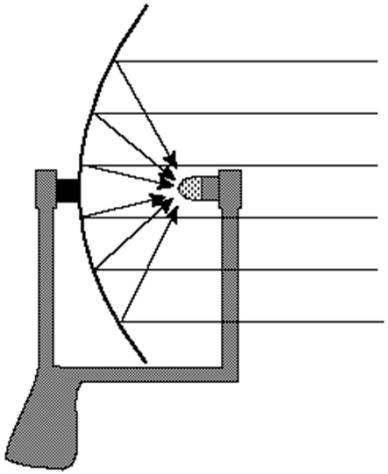
Polar diagram etc.

Diffuse field

Interference tube

Higher order

- Parabolic mirror



SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

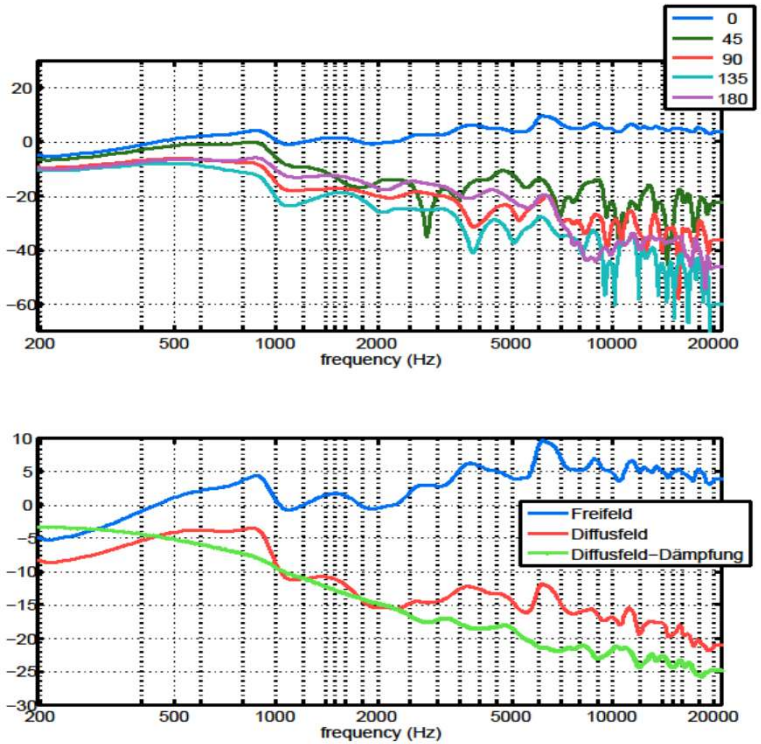
Polar diagram etc.

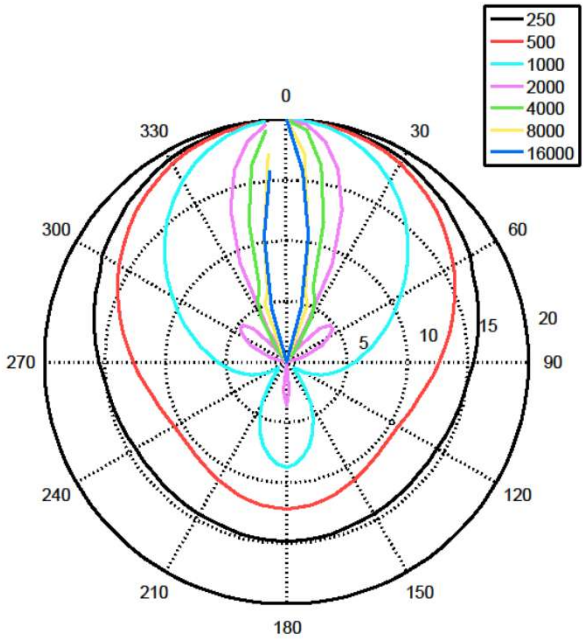
Diffuse field

Interference tube

Higher order

- Parabolic mirror





SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

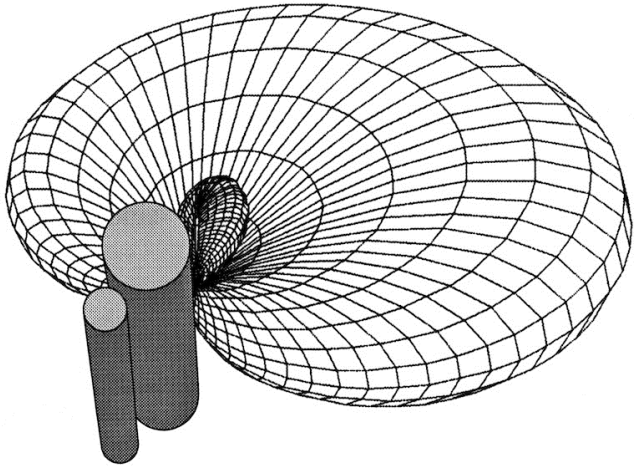
Polar diagram etc.

Diffuse field

Interference tube

Higher order

- Line array (KEM)



SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

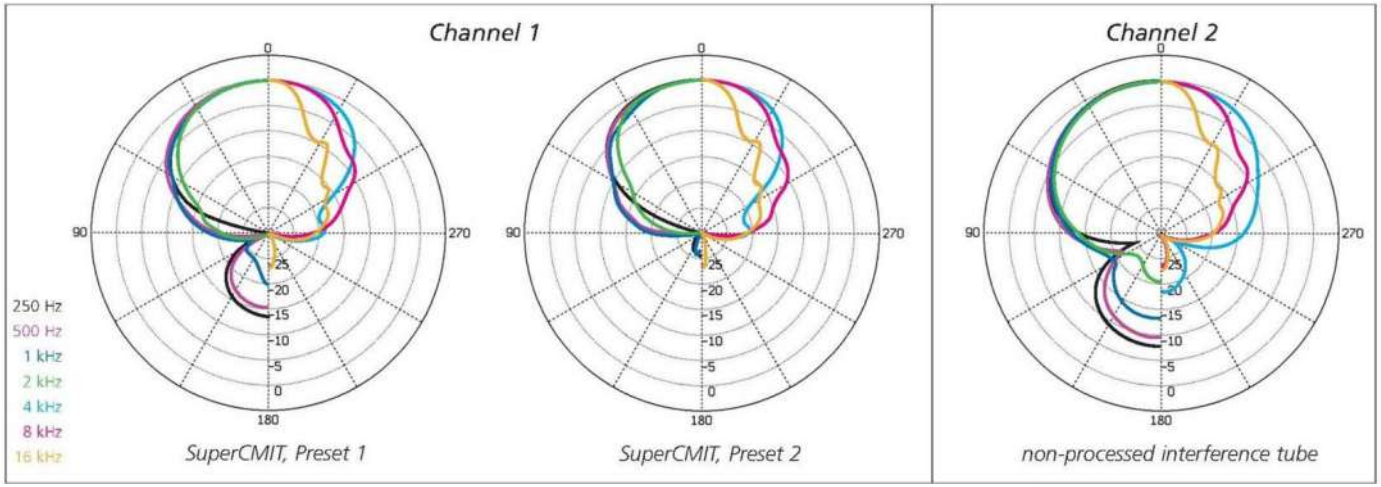
Polar diagram etc.

Diffuse field

Interference tube

Higher order

- Shotgun 2nd order (SuperCMIT)



SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

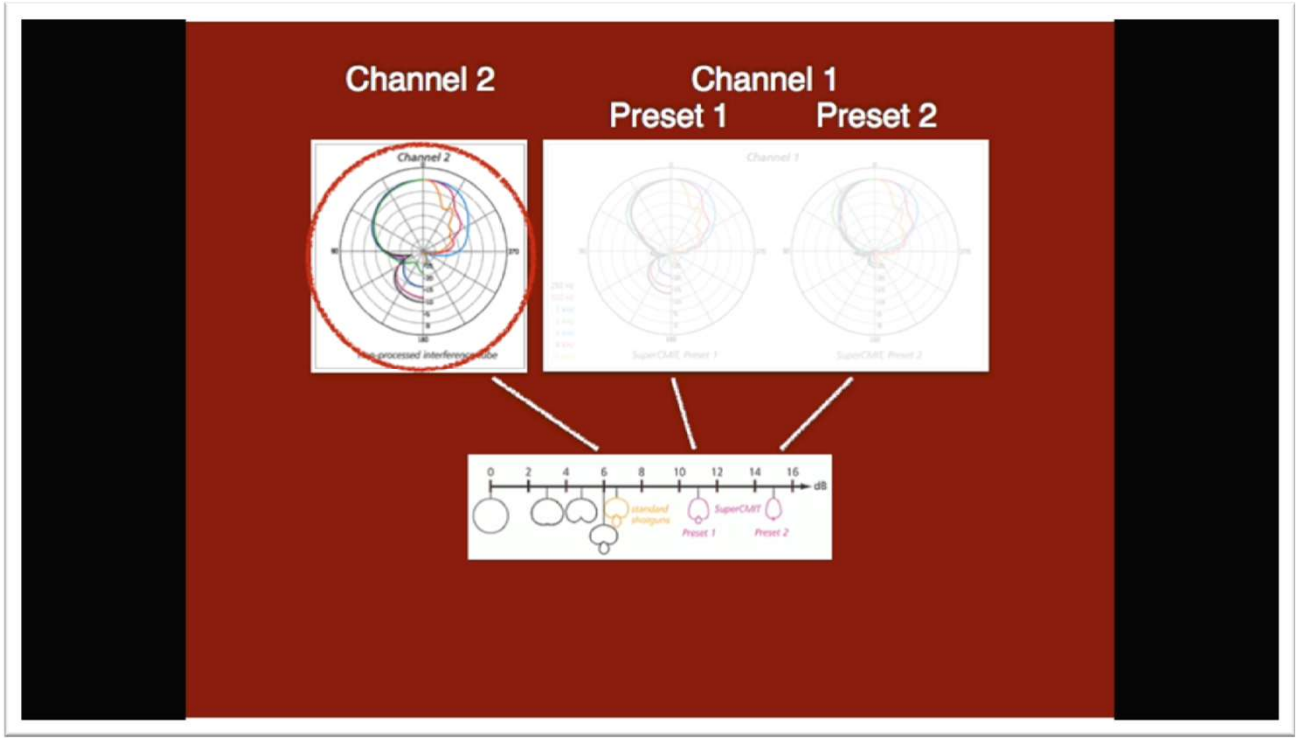
Polar diagram etc.

Diffuse field

Interference tube

Higher order

- Shotgun 2nd order (SuperCMIT)



SCHOEPS Mikrofone

Thank you for your attention!

wittek@schoeps.de

Helmut Wittek

SCHOEPS Mikrofone

Directivity

Why?

Front to somewhere else ratios

Distance factor

Polar diagram etc.

Diffuse field

Interference tube

Higher order