MUO'S FAGDAGER
BYSCENEN | TRONDHEIM | 3.-4. FEBRUAR 2016
LYD I GRENSELAND

Trondheim, February 3, 2016

Sound level control at large events part 1: festivals

Marcel Kok M.Sc. MBA

ONSDAG:

1. introduction
2. world of dBcontrol
3. history of sound level management
4. calculation of sound
5. sound measurement plan
6. materials
7. case: I love Techno, Gent, Belgium
8. various troubles / 5 cases
9. a movie from Norway

TORSDAG:

1. history of the 103 dB(A)
2. rules in Belgium for the ears
3. covenant in the Netherlands
4. measurements and systems
5. various troubles and cases
6. research audience yelling
7. research / Ph.D.
8. future with decibel rules in Norway
9. roundup

1. Introduction

Short introduction of Marcel
- education :
    - University of Twente, Electrical Engineering,
    - MBA,
- parttime FOH engineer since 1982
- work experience: consultancy firms, municipal, dBcontrol
- Ph.D. student @ University Ghent, Belgium

dBcontrol

EVENT NOISE MONITORING
CONSULTANCY & RESEARCH

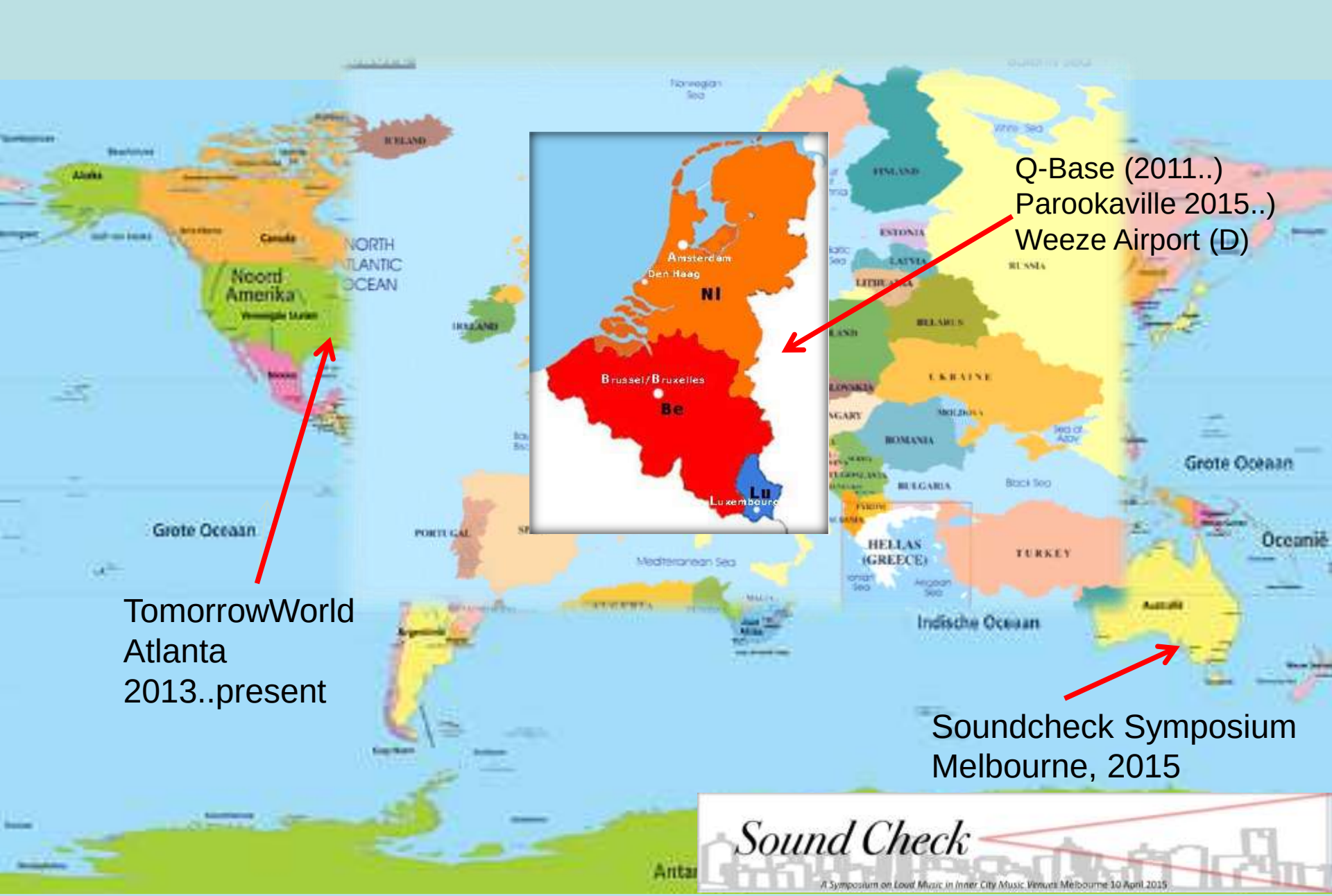
2. Welcome to the world of dBcontrol

short history of dBcontrol

started in 1998
founded in 2001
take over 1-1-2008

lean and mean company

dBcontrol is shirt sponsor of the BMC ice hockey club in Hoorn NL.



Q-Base (2011..)
Parookaville 2015..)
Weeze Airport (D)

TomorrowWorld
Atlanta
2013..present

Soundcheck Symposium
Melbourne, 2015

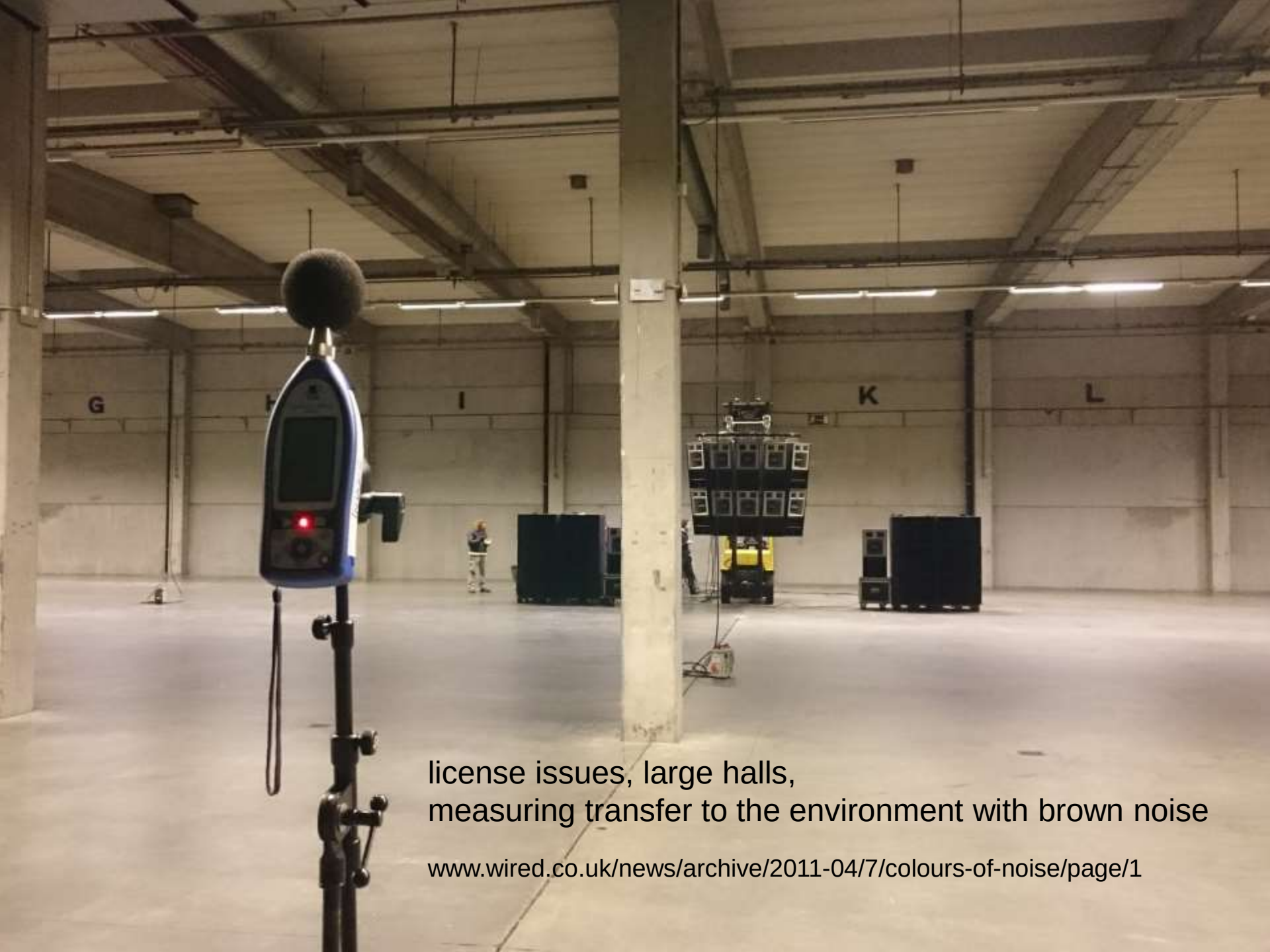
reverberation, museum HKA, Antwerp

reverberation, sports hall, Haarlem

reverberation, museum HKA, Antwerp

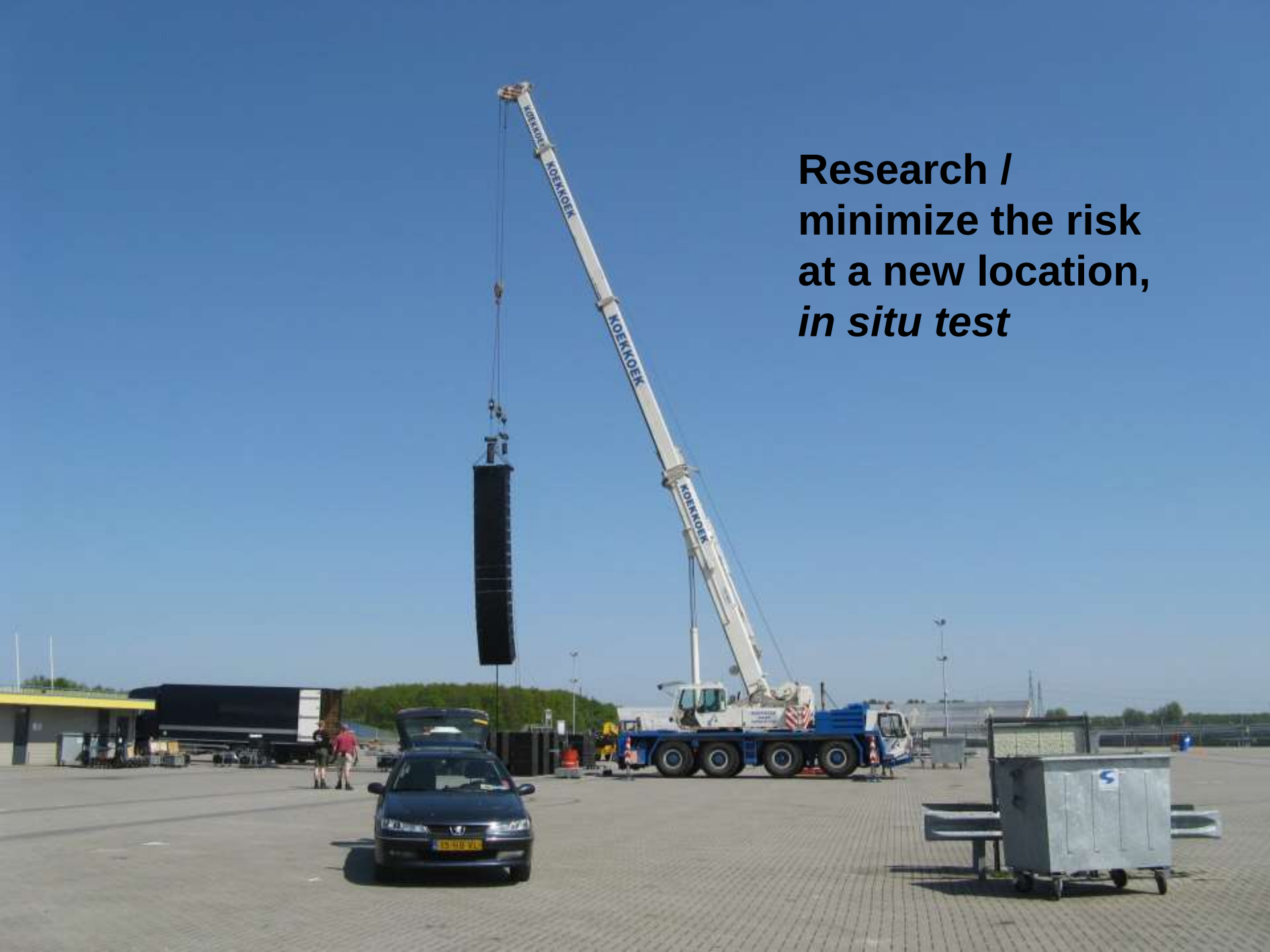
reverberation, expo hall

license issues, large halls



license issues, large halls,
measuring transfer to the environment with brown noise

www.wired.co.uk/news/archive/2011-04/7/colours-of-noise/page/1



Research / minimize the risk at a new location, *in situ test*

Wednesday:

1. introduction
2. world of dBcontrol
3. **history and sound level management**

Why sound level control?

- Historical perspective: population growth in Europe
- Building of houses next to industry, roads, parks
- smart neigbours & pensionados.....
- Events have developed since 1968:

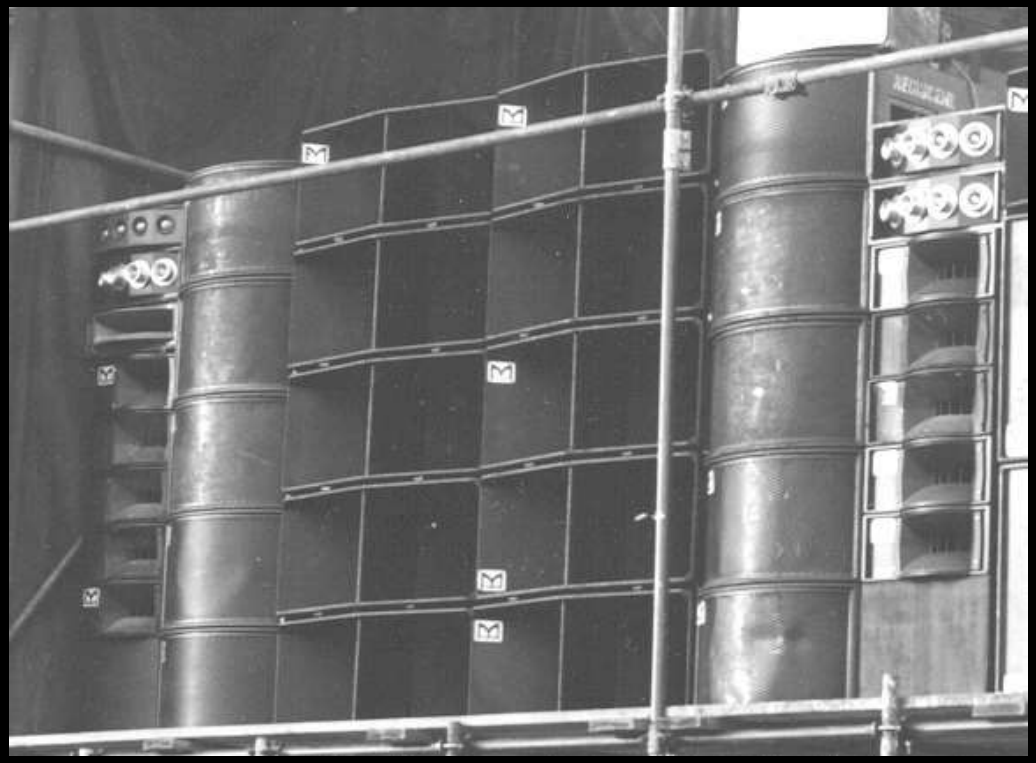
development of festivals:

from “1 or 2 days – 1 stage / 1 area”

towards.....

more days – more areas

4 ..7 days, up to 15 area's



1975

2001

Development in sound systems

- More power (kilowatts)
- More power in low frequencies
- Lower frequencies (35 Hz.)

U2 FINED EU36K FOR TOO-LOUD CROKER GIGS

Evening Herald, November 12, 2009
By: Cormac Murphy

Some might say U2 have been creating noise pollution for years.

And now the Dublin supergroup have been fined (EU)36,000 after they breached noise levels during their Croke Park concerts in July.

Dublin City Council has issued penalties against music promoters MCD after Bono and his bandmates exceeded the allowed limits on a number of occasions during the gigs.

The council said, apart from the noise breaches, all other conditions attached to the Public Event Licence allowing the concerts to go ahead were complied with in full.

Surety

A condition of the licence was that a cash deposit of (EU)80,000 be lodged as a surety for maintaining noise limits.

A spokesman for the council told the Herald the band were responsible for 12 breaches over the three nights of the concerts, with a (EU)3,000 penalty applying each time.

The fines were by no means the first to be issued by the council after high-profile performers exceeded noise levels.

Last year, two of the country's biggest promoters were hit with penalties after Bruce Springsteen and Boyzone concerts broke the strict regulations.

Aiken Promotions had a (EU)50,000 deposit withheld by the local authority after the Springsteen gig, staged at the RDS arena in the summer of 2008, exceeded the permitted 75 decibel levels, with some songs topping out at 87dB.

MCD was fined (EU)40,000 after a Boyzone concert at RDS on June 28 hit noise levels of 78.9 dB.

A third act that appeared outdoors at the RDS last year, U.S. heavy metal group Linkin Park, was found not to have breached any noise levels.

Even before Bono took to the stage at Croke Park, the gigs were hit with controversy and complaints.

The director of the stadium, Peter McKenna, admitted prior to the concerts that there would have to be a "serious rethink" as to how Croke Park staged large-scale events.

THE NEWS TODAY

- Jan 19 Sheridan: 'U2 sure bet for an Oscar'
- Jan 18 Legend of Bono's 1987 death threat alive but unsubstantiated
- Jan 17 Column: off the record.... vol. 10-393
- Jan 16 Like a Song: In God's Country
- Jan 13 BBC admits it went too far in U2 tie-up
- Jan 10 Column: off the record.... vol. 10-392
- Jan 07 It Might Get Loud Opens In Dublin
- Jan 05 @U2 OOM December 2009: A U2 Gift
- Jan 03 Column: off the record.... vol. 10-391
- Jan 03 Bono calls for control over Internet downloads

RECENT @U2 BLOG POSTS

- Scattered Thoughts: Edge's Poker Face
- U2 & NASCAR: What's up with that?
- Eno on Bono, U2, & Coldplay
- How to Use @U2's iPhone App
- Wanna hear 'Heartland' live?

@U2 CALENDAR

January 21 2010

2U Tribute Band Performance

The world's "Second Best U2 Show"

January 22 2010

Bono to Perform in Haitian Relief Concert

Details to follow soon.

Full Calendar

SHOP

U2 on iTunes (USA)
Amazon.com
Amazon UK
Amazon Canada
U2 at Wolfgang's Vault
EB.com
U2 Sheet Music
CD Universe
AllPosters.com

Why decibel control?

- continuation of the license (long term perspective)
- to prevent a fine
- outsourcing of the decibel problem
- monitoring to prevent “music induced hearing disorder” at specific concerts (mostly children shows, liability)

Toldo:	k vond het erg vet!!! het was inderdaad koud...brrrr maar evengoed vet, tis toch buiten hè!
-- 'Loesje:	Gezellig feestje alleen heel slecht geluid!
--:bounce:Maar-ten:bounce:--:	Wederom jammer van het geluid...
--MARLOE*S:	geluid was kut! sfeer was goed, behalve aan het einde. de rij bij de gaderobe was een hel, kut belgen!
-X-ASHLEY:	Ik vond het een goei feestje!
.lex.:	volgende keer gewoon kaartjes duurder maken en beter geluid regelen dan is het een topfeest!
.Stef.:	In het begin was het toch zwaar slecht geluid, maar dat was op een gegeven moment wel beter. Verder waarschijnlijk gewoon weer het gezelligste feestje van 2009.
.Yvon.:	Super feest!! Gezellige avond gehad en helemaal uit mijn dak gegaan bij milk inc en lasgo mogen ze vaker doen in de winter zo een feestje
///RoEltjE:	Superfeestje! Gezellig sfeertje, en goede kriek
:NICK!:	het volume mocht idd wel flink omhoog! vanaf een uur of 12 was het onderhand wat hardcore!
:xtc: Ad van de pad :xtc::	het was zwaar koud en het geluid mocht veel harder.. maar heb me zeker vermaakt
[=Hardcore=]-PauLusku(Y)(H):	Al ai .. dit had ik niet verwacht va[redacted]en toevoeging van 4 tenten.. maar geen verbeteringen .. vorig jaar was 't beter! komop volgend jaar ben ik er weer en dan wil ik echt een knalfeest zien
[Hardcore] Pussy motherfuckers!!!:	Agressief kutvolk Gelukkig met heéééél veel volk daar dus dat zorgde toch nog voor een veilig gevoel Voor de rest gewoon goed geamuseerd en feest gemaakt daar
[HS]_(sc)_[HS]:	geluid de vechtpartijen maar tog heb ik me goed vermaakt op [redacted]Headhunterz Darkraver dstf
[J]ustus:	Was dus echt heel slecht, qua geluid, qua sfeer..
[NL]Mause:	was goeie muziek alleen geluid veelste zacht da was wel jammer ma voor de rest was er perfect
^Kimmie:	Super vet, echt goeie sfeer, volgend jaar weer!
Driekus:	Goed vermaakt, maar het geluid was dramatisch
A-Lex:	Waardeloos geluid... koud... druk... Organisatie: schaam je diep.... maar toch, best vermaakt
Andy.:	Eigenlijk was vrijwel alles gewoon kut, maar de alcohol en de gezelligheid maakte een hoop goed Psyko Punkz & A2
B-Ware | In-Phase:	Geluid wat minder, maar voor de rest wel inorde
Bass^:	Slecht geluid, verder wel gezellig gehad, Lasgo
BasVonD:	get a life: koud kutfeest met kutbelgen

social media reactions on electronic dance festivals: optimalisation within the limit is very important

JA
DAS MUSS
SO LAUT!

ECC: EVENT CONTROL CENTER

phase 1
passive

Which level?

sample measurement

ad-hoc

WHAT ?

phase 1
passive

Which level?

sample measurement

ad-hoc

phase 2
reactive

MONITORING

whole period

report & conclusions

thinking about (special) solutions

WHAT ?

phase 1 passive	phase 2 reactive	phase 3 pro-active
Which level? sample measurement ad-hoc	<u>MONITORING</u> whole period report & conclusions thinking about (special) solutions	prediction model, calculation of levels optimization of decibel headroom in planning phase implementing solutions monitoring + sound control + report

WHAT ?

phase 1 passive	phase 2 reactive	phase 3 pro-active	phase 4 collaboration
Which level? sample measurement ad-hoc	<u>MONITORING</u> whole period report & conclusions thinking about (special) solutions	prediction model, calculation of levels optimization of decibel headroom in planning phase implementing solutions monitoring + sound control + report	transparancy in information information to the neighbours (+ evaluation) realtime internet information monitoring + sound control + report

WHAT ?

Communication : 7 stakeholders

The SOUND GUARD
- watches the results
- talks to the stakeholders
- consultancy
- has authorisation!

www.dBcontrol.nl

NME.COM *First For Music News*

FIRST FOR MUSIC NEWS

NME Festival Guide
2010

2010 LINE-UP BOARDS

NME News

Glastonbury responds to Killers and Arctic Monkey sound complaints

Festival chief says sorry to fans for too quiet shows

June 24, 2007 | 0 Comments

The Killers headline the Pyramid Stage, 22.55pm 23 June Glastonbury 2007. Pic: Tom Oxley

Glastonbury festival chiefs have apologised for the quality of sound on the **Pyramid Stag**

Festival goers complained vocally during headlining sets by Arctic Monkeys (June 21) and
quiet.

During Arctic Monkeys' performance on the opening night frontman **Alex Turner** became

"What are you saying, 'louder'?" he asked from the stage. "I can't tell if they're happy or angry. Thumbs up for the man at the front."

Though the band received a sea of thumbs in approval, the grumbles about the sound continued for the set, especially when Dizzee Rascal arrived for his guest slot and his contribution to **'Temptation Greets You Like A Naughty Friend'** was inaudible.

Meanwhile after The Killers played, fans complained to **NME.COM** that they could not really hear what was going on.

After chants of "turn it up", one fan told us after the gig: "The band were amazing but we had no sound in our bit, there was nearly a riot! We should complain to the management".

Ads by Google

place for 2010!

Tools :

instruction sheet

instruction meeting:
sound engineers and stage managers

62,7
62,9
60,8
58,3
62,7
59,6
61,8
58,4
62,0

ORBITAL sound
www.orbitalsound.com

PEOPLE | VIDEO CONTENT

VIDEO: Sound consultant Morten Büchert on 15 years at Roskilde

SHARE THIS STORY

Jon Chapple | 28 September 2015

SEND TO A FRIEND | PRINT

In June, *PSNEurope* travelled to the town of Roskilde in Denmark for the festival of the same name.

An interview with its principal audio consultant, Morten Büchert, appeared in the September issue of the magazine (read it online at Q&A: Morten Büchert, Roskilde); now, in a video filmed at Roskilde, editor Dave Robinson discovers the 15-year festival veteran's approach to selecting audio equipment – and why Büchert considers himself "a

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AES/EBU
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JANUARY ISSUE

IN THIS MONTH'S ISSUE

Cover story: cloud-based boost for broadcasters
The Strategic Position: David Angress, ADAM Audio
Pro-audio social network pushes forward

w- Morten mp4

PA supplier

FOH sound engineers

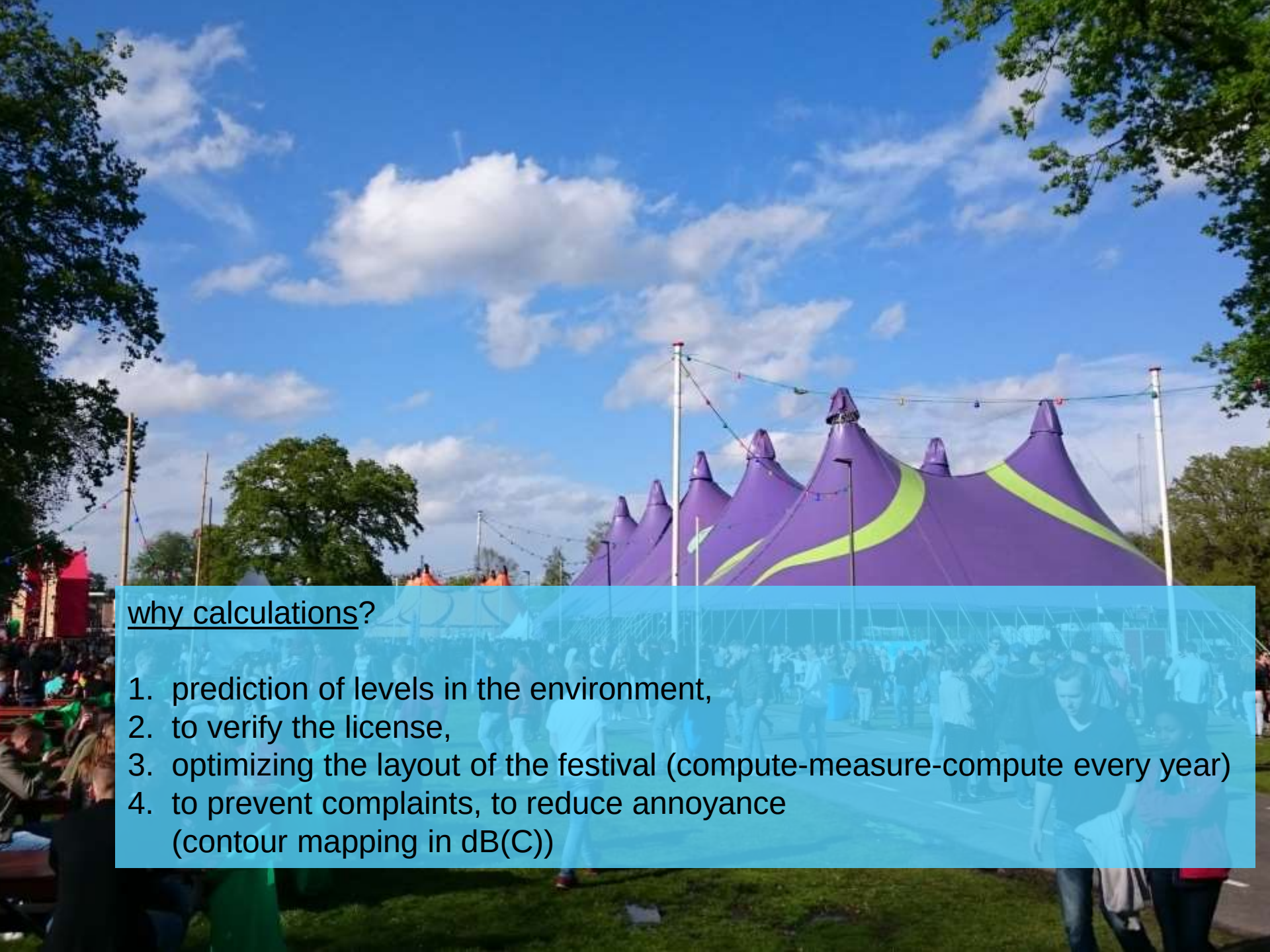
audio quality,
comfort, experience

level limits, decibels

model : audio quality and quantity control

Wednesday:

1. introduction
2. world of dBcontrol
3. history and sound level management
4. **calculation of sound**



why calculations?

1. prediction of levels in the environment,
2. to verify the license,
3. optimizing the layout of the festival (compute-measure-compute every year)
4. to prevent complaints, to reduce annoyance
   (contour mapping in dB(C))

For who?

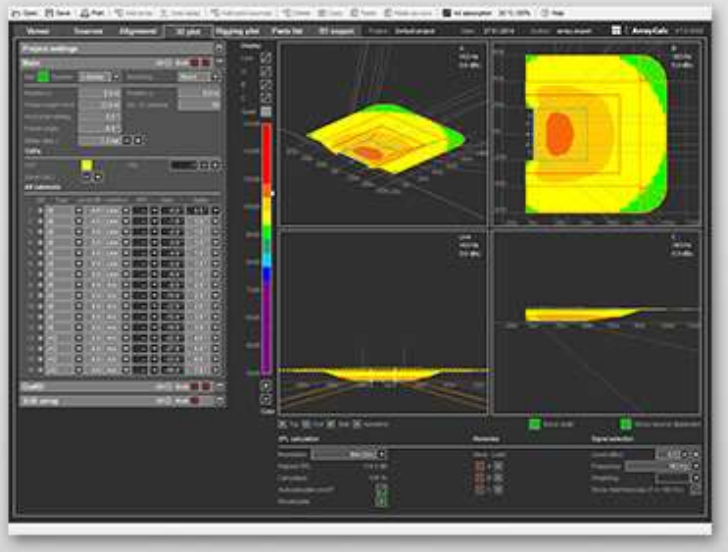
1. the promoter, technical crew, production
2. local council, local county, to verify the license before it’s given
3. the neighbours

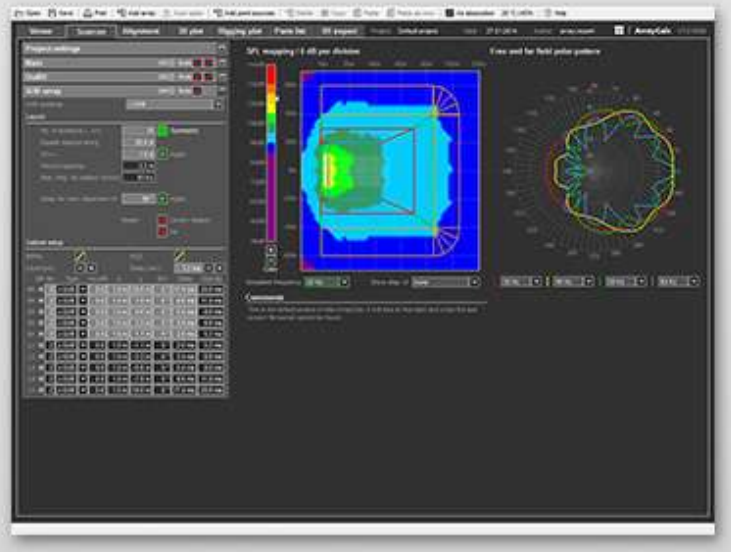
What's available on the market?

- loudspeaker software: disadvantage ground absorption, screens, air absorption

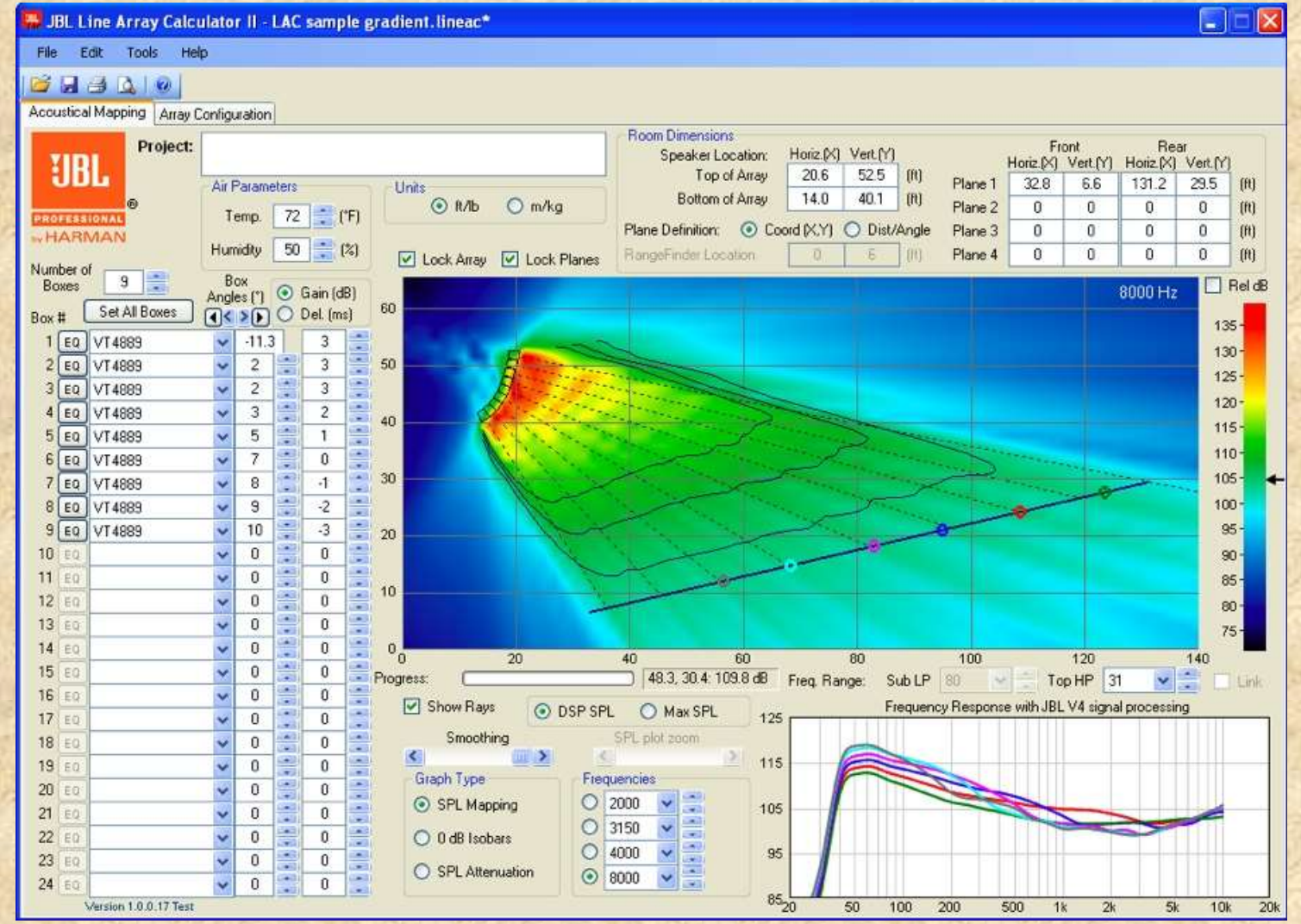
examples of loudspeaker manufacturer software (free on internet):

D&B :

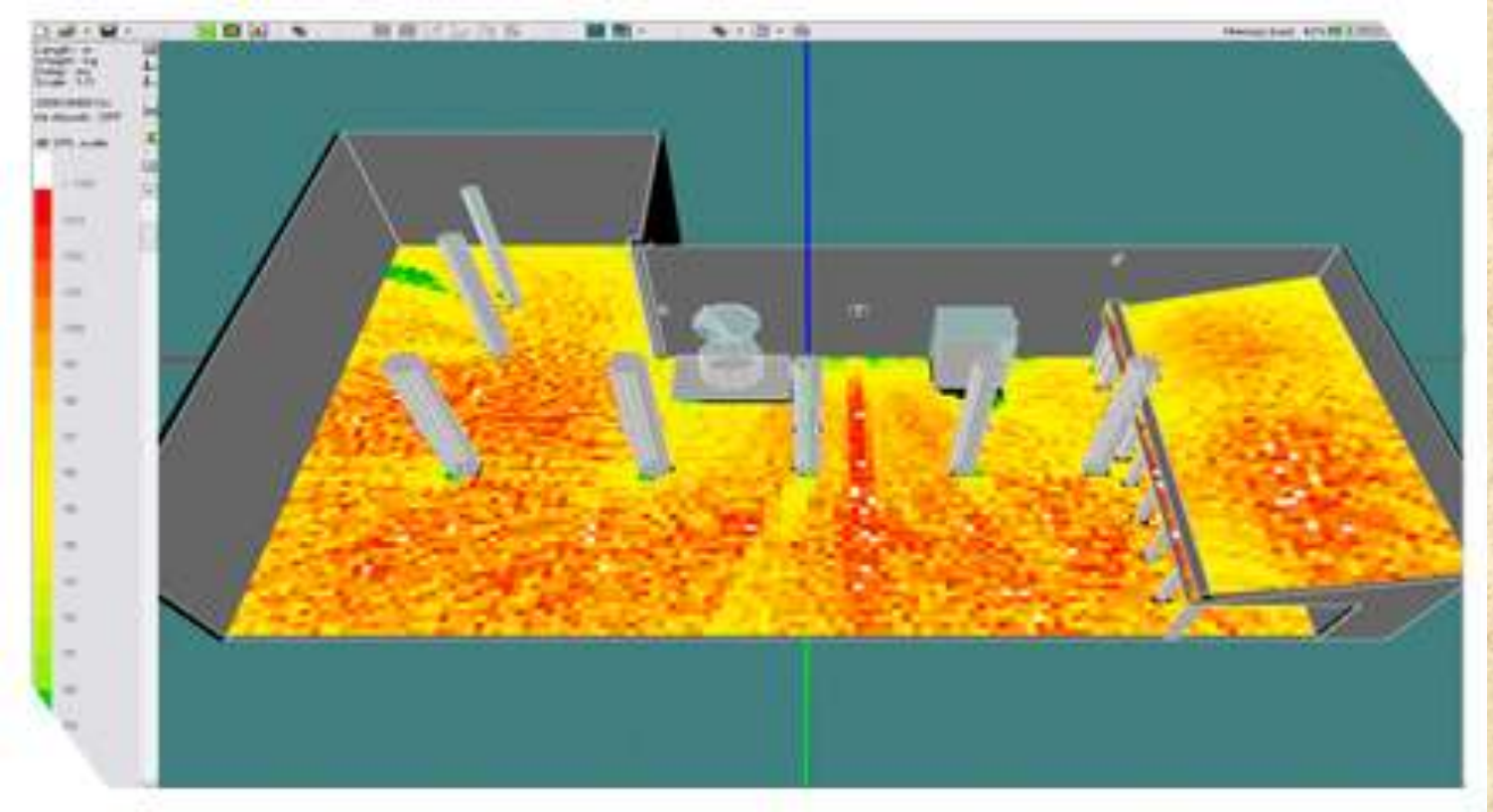


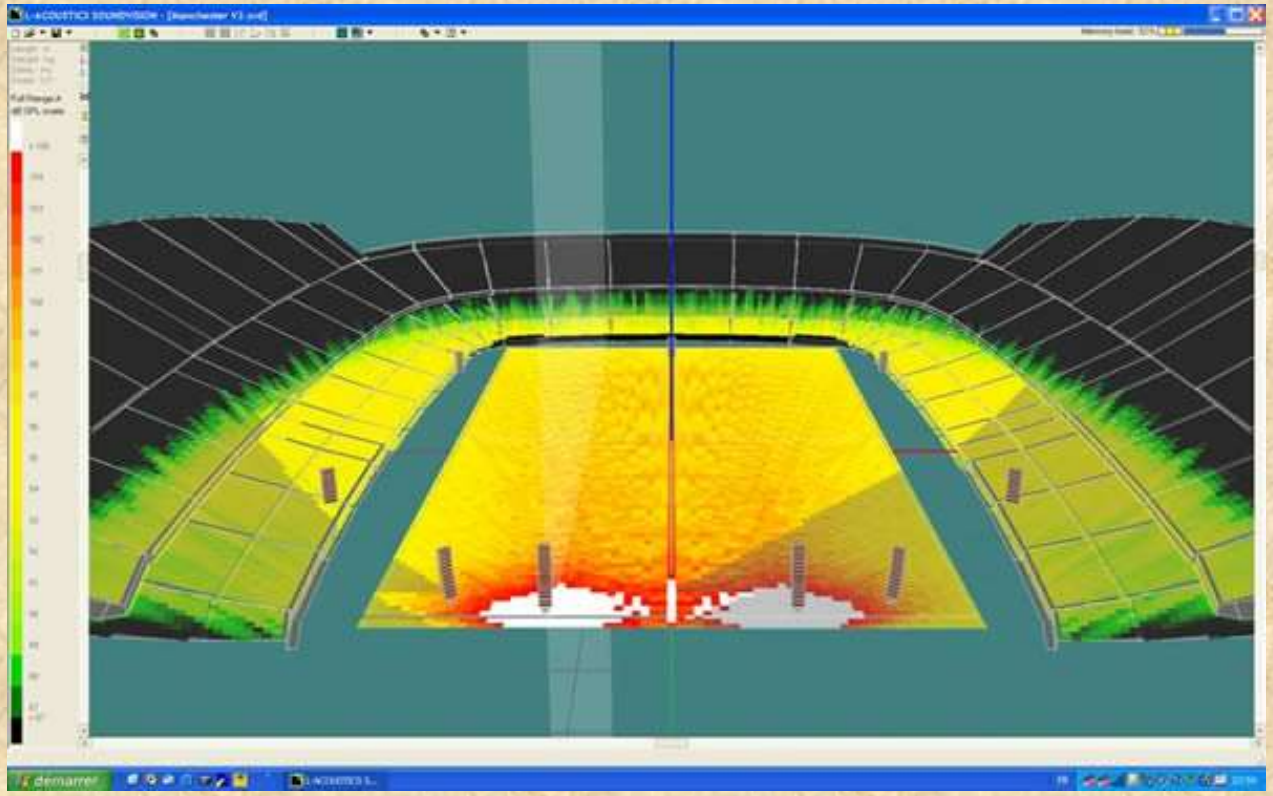


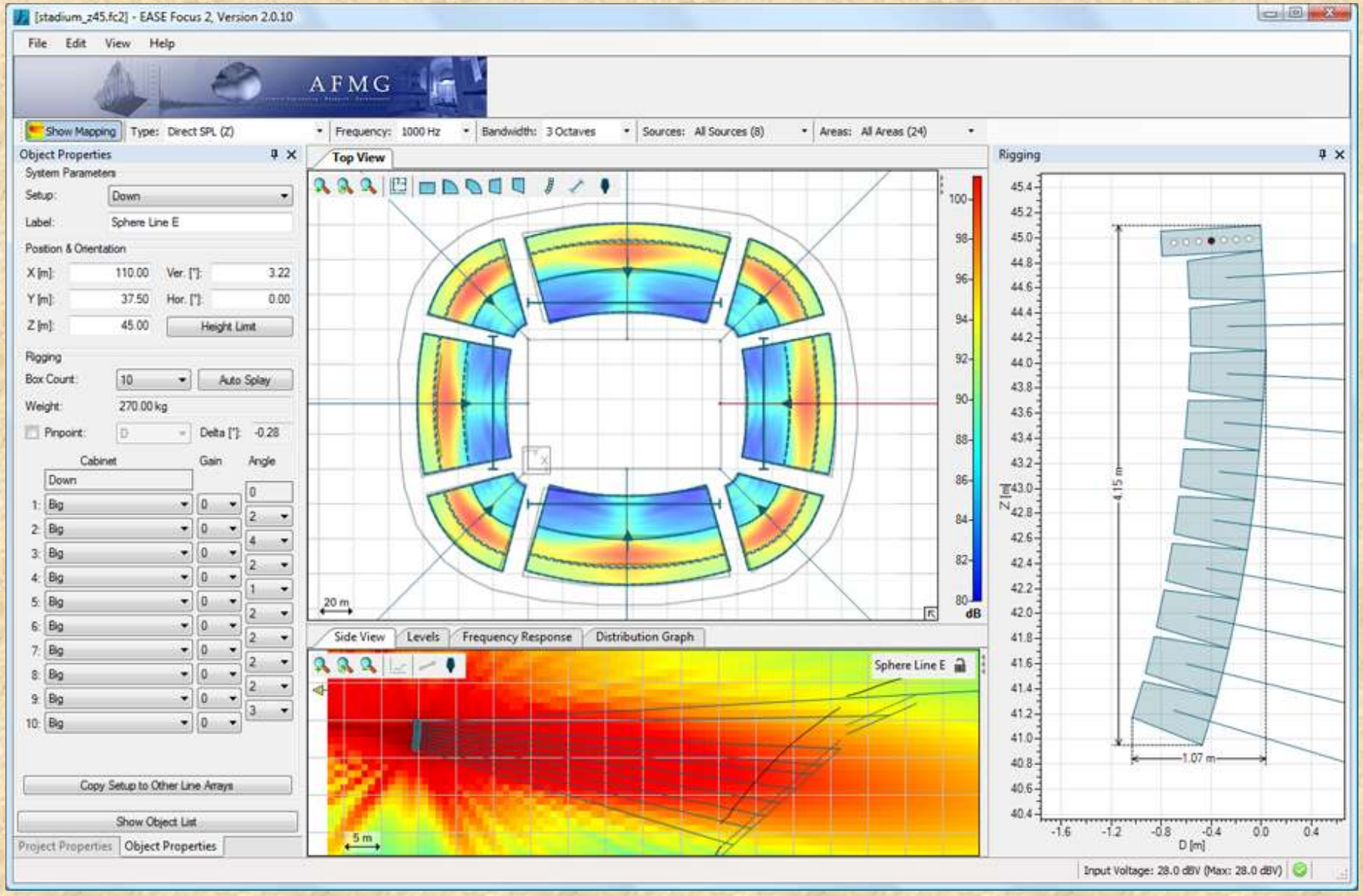
JBL :

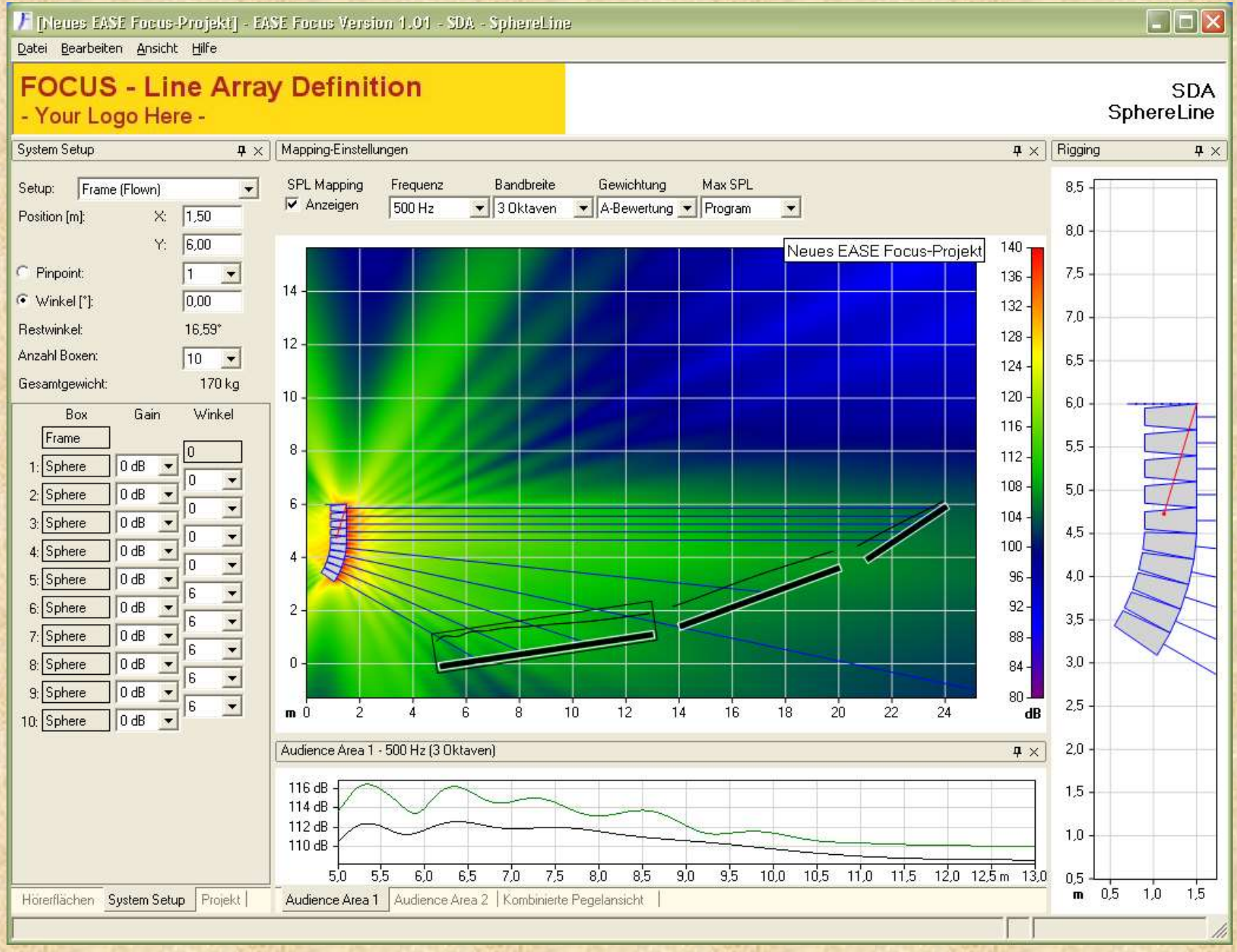

JBL Line Array Calculator II - LAC sample gradient.lineac*
File Edit Tools Help
Acoustical Mapping
Array Configuration
Project:
Air Parameters
Temp. 72 (°F)
Humidity 50 (%)
Units
ft/lb
m/kg
Lock Array
Lock Planes
Number of Boxes 9
Box Angles (°)
Gain (dB)
Del. (ms)
Box #
Set All Boxes
VT4889
Room Dimensions
Speaker Location:
Horiz.(X) Vert.(Y)
Top of Array 20.6 52.5 (ft)
Bottom of Array 14.0 40.1 (ft)
Plane Definition: Coord (X,Y) Dist/Angle
RangeFinder Location
Front
Rear
Plane 1 32.8 6.6 131.2 29.5 (ft)
Plane 2 0 0 0 0 (ft)
Plane 3 0 0 0 0 (ft)
Plane 4 0 0 0 0 (ft)
8000 Hz
Rel dB
Progress:
48.3, 30.4: 109.8 dB
Freq. Range:
Sub LP
Top HP
Link
Show Rays
DSP SPL
Max SPL
Smoothing
SPL plot zoom
Graph Type
SPL Mapping
0 dB Isobars
SPL Attenuation
Frequencies
2000
3150
4000
8000
Frequency Response with JBL V4 signal processing
Version 1.0.0.17 Test

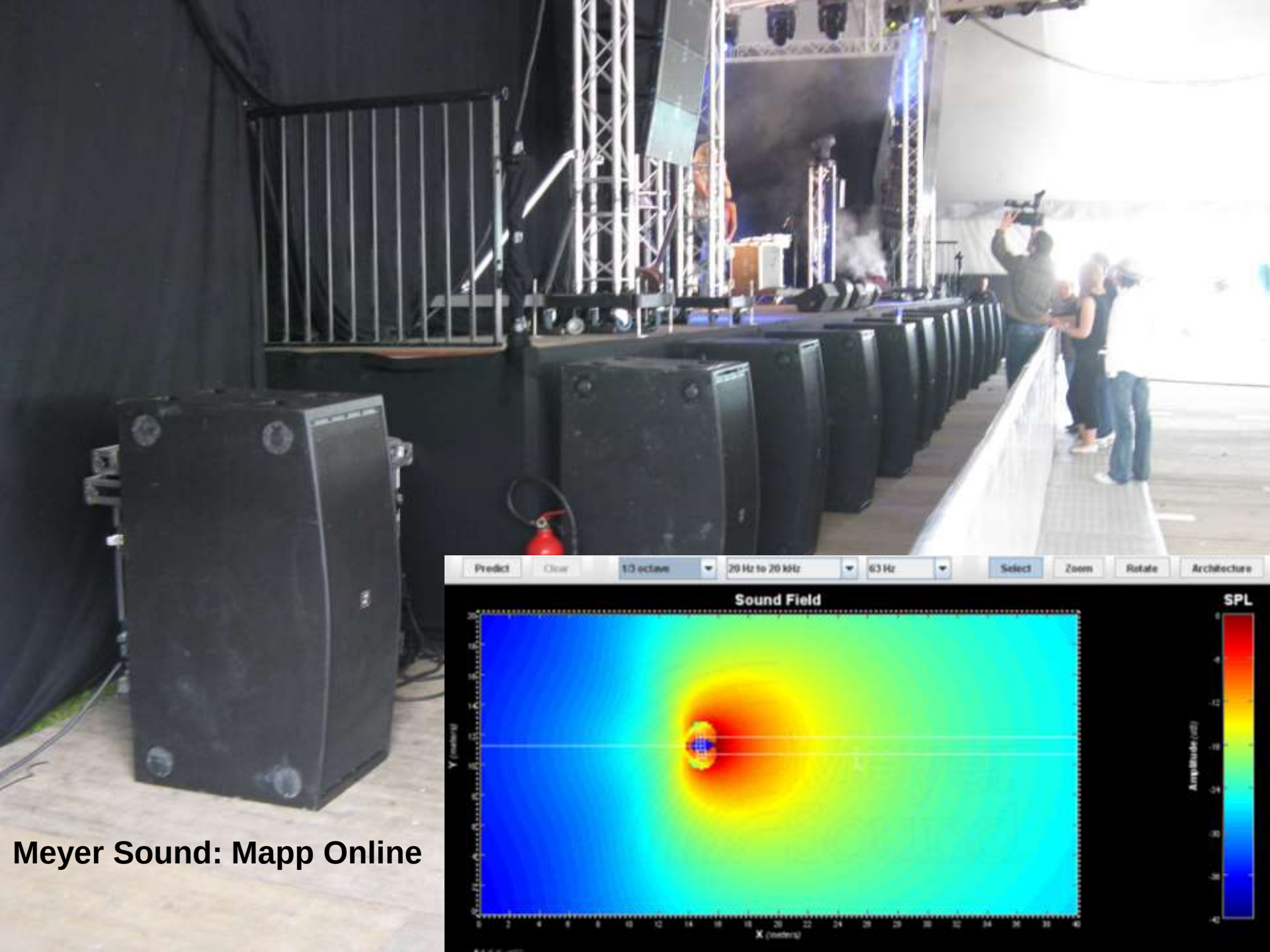
L-Acoustics (SoundVision software) :



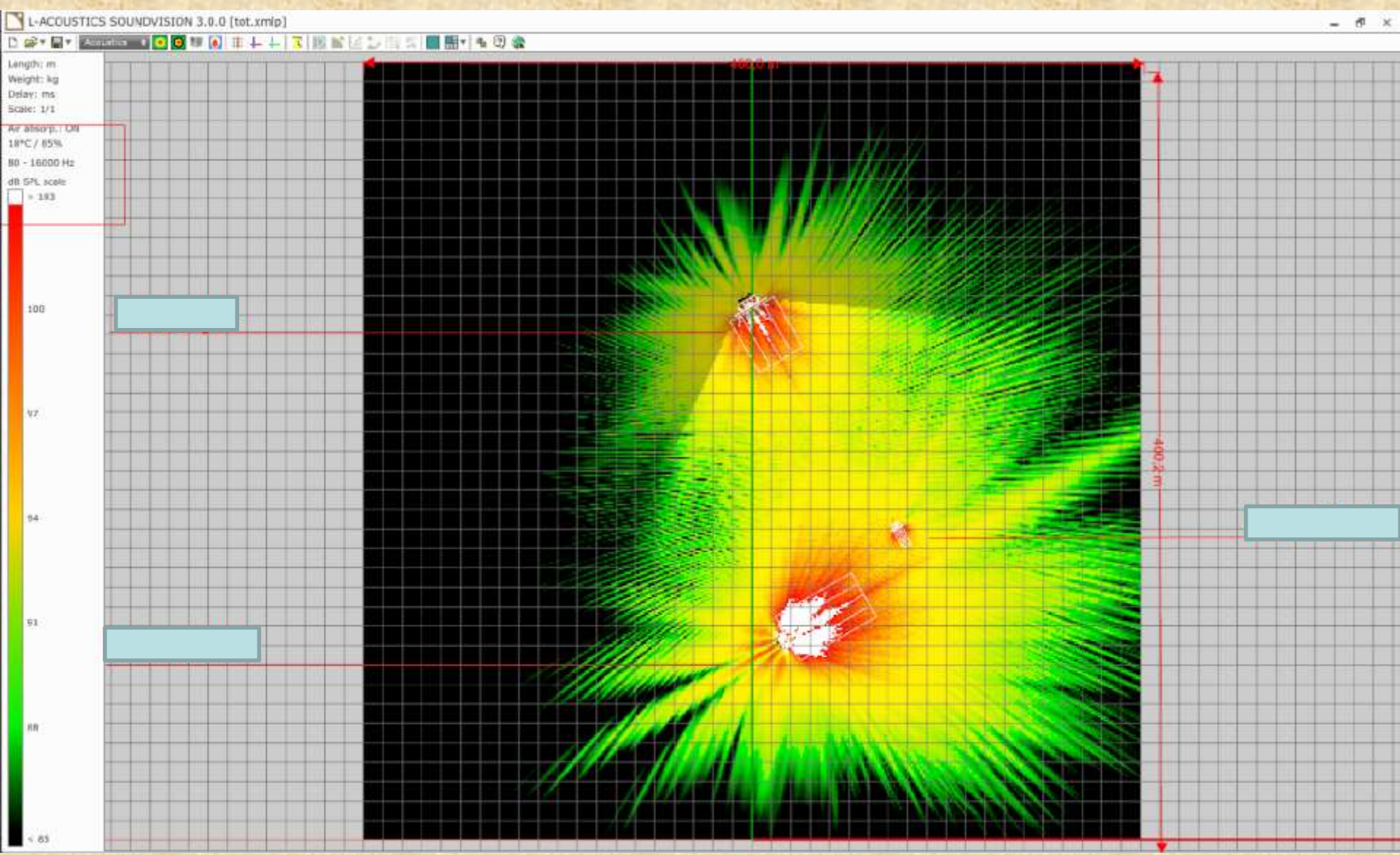


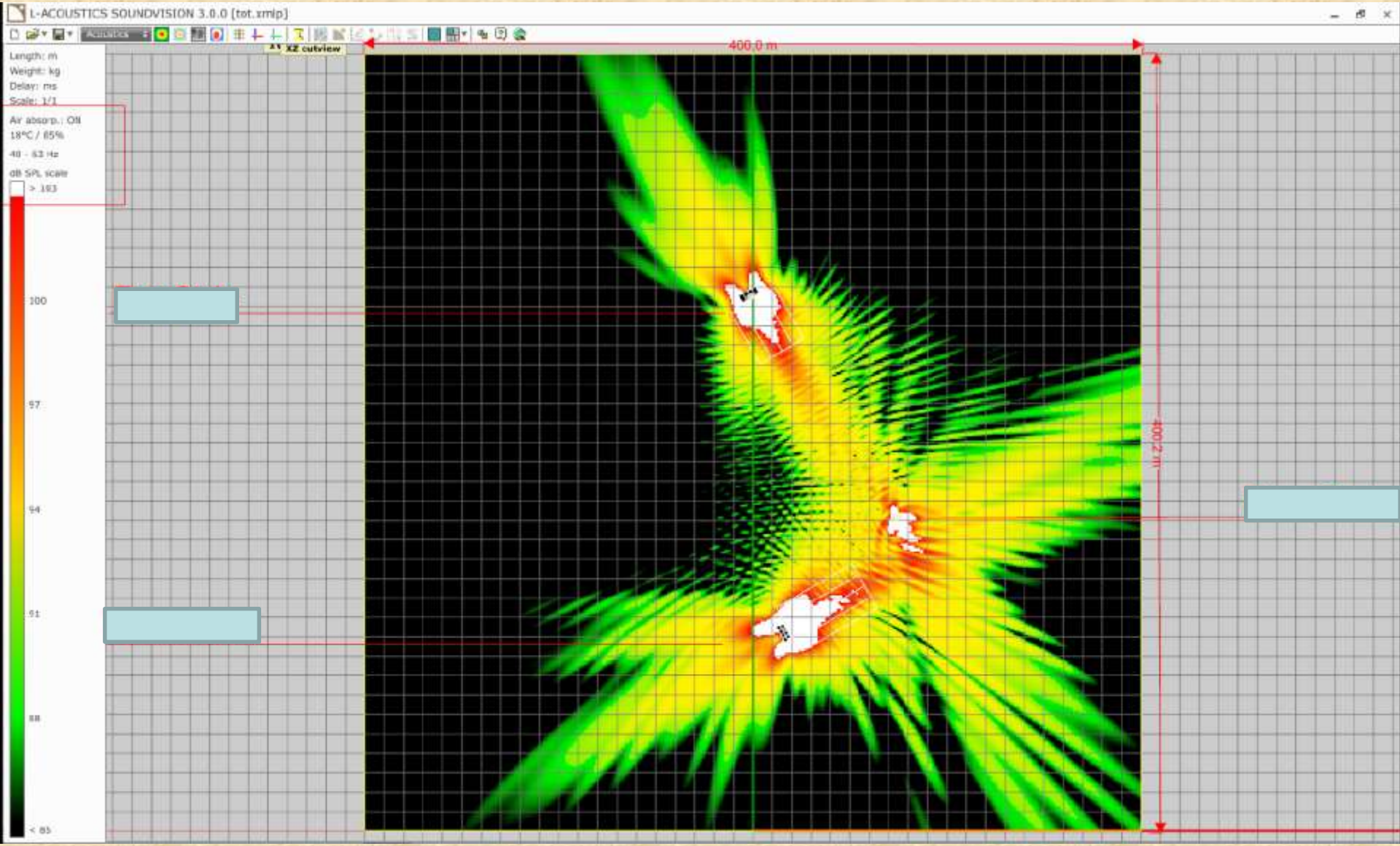

[stadium_z45.fc2] - EASE Focus 2, Version 2.0.10
File Edit View Help
AFMG
Show Mapping
Type: Direct SPL (Z)
Frequency: 1000 Hz
Bandwidth: 3 Octaves
Sources: All Sources (8)
Areas: All Areas (24)
Object Properties
System Parameters
Setup: Down
Label: Sphere Line E
Position & Orientation
X [m]: 110.00
Ver. [°]: 3.22
Y [m]: 37.50
Hor. [°]: 0.00
Z [m]: 45.00
Height Limit
Rigging
Box Count: 10
Auto Splay
Weight: 270.00 kg
Pinpoint:
Delta [°]: -0.28
Cabinet
Gain
Angle
Down
1: Big
2: Big
3: Big
4: Big
5: Big
6: Big
7: Big
8: Big
9: Big
10: Big
Copy Setup to Other Line Arrays
Show Object List
Project Properties
Object Properties
Top View
20 m
dB
Side View
Levels
Frequency Response
Distribution Graph
Sphere Line E
5 m
Rigging
4.15 m
1.07 m
Z [m]
D [m]
Input Voltage: 28.0 dBV (Max: 28.0 dBV)


[Neues EASE Focus-Projekt] - EASE Focus Version 1.01 - SDA - SphereLine
Datei Bearbeiten Ansicht Hilfe
FOCUS - Line Array Definition
- Your Logo Here -
SDA
SphereLine
System Setup
Setup: Frame (Flown)
Position [m]: X: 1,50
Y: 6,00
Pinpoint: 1
Winkel [°]: 0,00
Restwinkel: 16,59°
Anzahl Boxen: 10
Gesamtgewicht: 170 kg
Box Gain Winkel
Frame 0
1: Sphere 0 dB 0
2: Sphere 0 dB 0
3: Sphere 0 dB 0
4: Sphere 0 dB 0
5: Sphere 0 dB 6
6: Sphere 0 dB 6
7: Sphere 0 dB 6
8: Sphere 0 dB 6
9: Sphere 0 dB 6
10: Sphere 0 dB
Hörerflächen System Setup Projekt
Mapping-Einstellungen
SPL Mapping
Anzeigen
Frequenz 500 Hz
Bandbreite 3 Oktaven
Gewichtung A-Bewertung
Max SPL Program
Neues EASE Focus-Projekt
m
dB
Audience Area 1 - 500 Hz (3 Oktaven)
116 dB
114 dB
112 dB
110 dB
m
Audience Area 1 Audience Area 2 Kombinierte Pegelansicht
Rigging
m



Meyer Sound: Mapp Online


L-ACOUSTICS SOUNDVISION 3.0.0 [tot.xmlp]
Length: m
Weight: kg
Delay: ms
Scale: 1/1
Air absorp.: ON
18°C / 65%
80 - 16000 Hz
dB SPL scale
> 103
100
97
94
91
88
< 85
400.2 m


L-ACOUSTICS SOUNDVISION 3.0.0 [tot.xmlp]
XZ cutview
400.0 m
100.2 m
Length: m
Weight: kg
Delay: ms
Scale: 1/1
Air absorp.: ON
18°C / 65%
40 - 63 Hz
dB SPL scale
> 103
100
97
94
91
88
< 85

what's on the market?

- loudspeakersoftware, disadvantage
    - no ground absorption
    - no screening effects
    - sometimes no air absorption
    - not designed for long distances (> 200 meters)

- official acoustic consultancy software:
    - Soundplan, Immi, CadNa, ISO 9616, Geonoise
    - for environmental licenses,

Wölfel

IMMI

Noise Mapping & Noise Prediction

CadnaA at a glance

Whether your objective is to study the noise Immission level of an industrial plant, a mall including a parking lot, a road and railway scheme or even of an entire town with airport:

CadnaA is designed to handle all these tasks!

Interactive Online Presentation

We present CadnaA online and interactive (15min-45min)
See the most relevant features according to your individual needs
All you need is a PC with internet connection and a telephone

Enquire at info@datakustik.com

Intuitive Handling

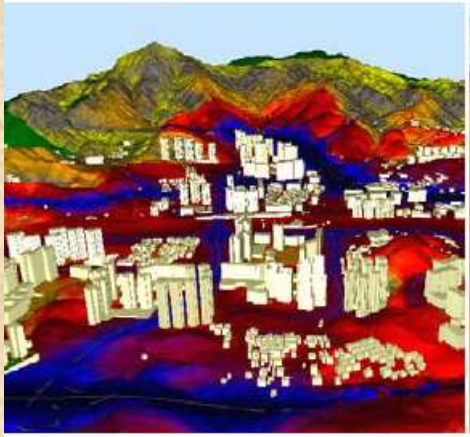
Work within the plain, clearly arranged surface for simple calculations, but benefit at the same time from the sophisticated input possibilities as your analysis becomes more complex.
Focus your time on the project and not on the software. All input and analysis features are easy and intuitive to handle.

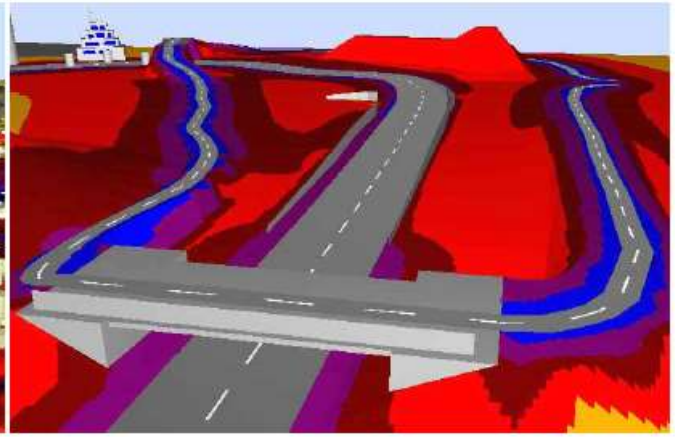
Enhanced Productivity

Change your view from 2D to 3D within a second. Multiply the modeling speed by using various shortcuts and automation techniques. Various time-saving acceleration techniques enable fast calculations for your projects. Access all object data instantly.

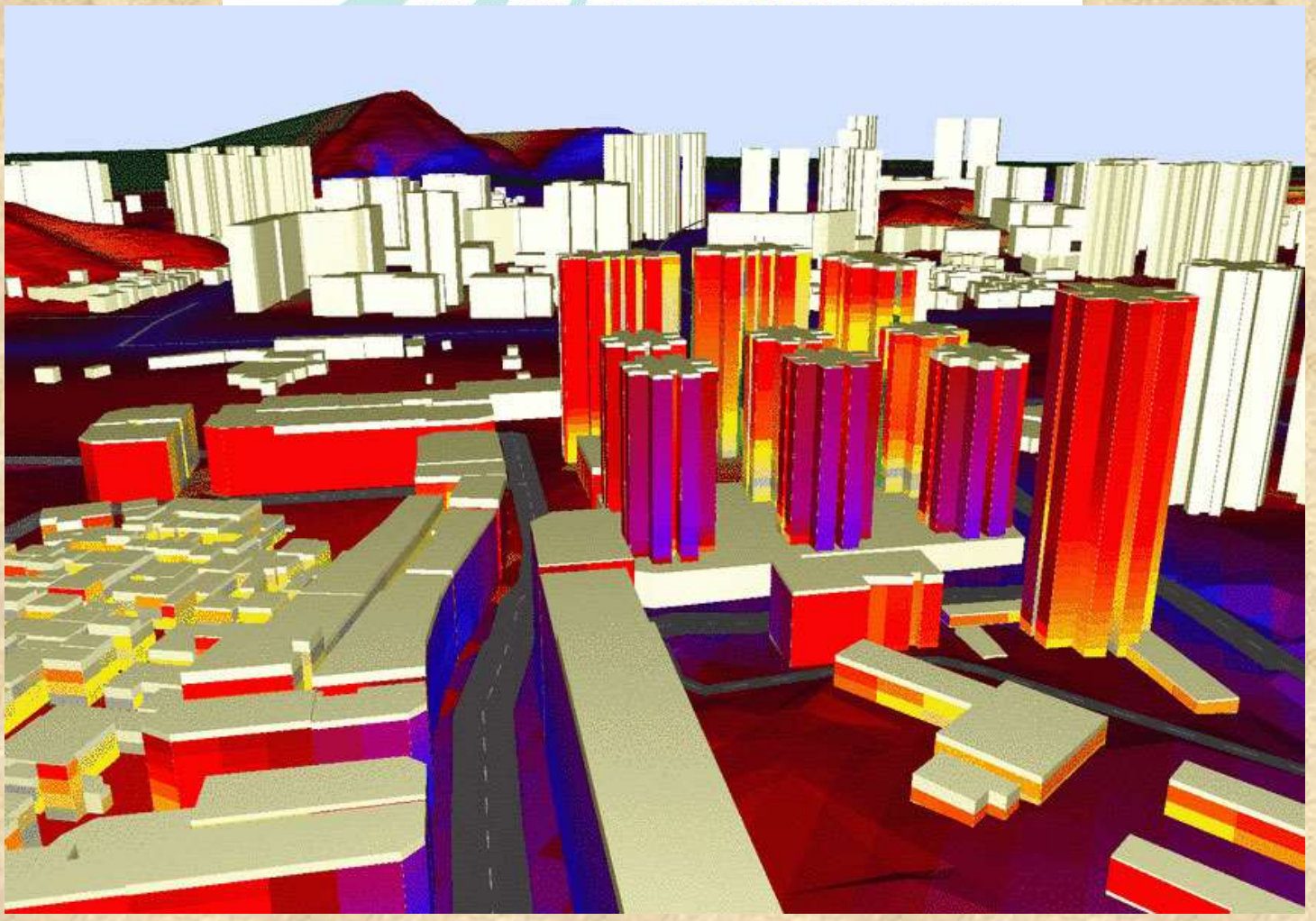
Advanced Analysis

Base your analysis on quality-assured national and international standards, calculation methods and guidelines. Execute predefined or customized analysis of all data contained in the model: building evaluation, hot spot detection, conflict map, etc.





CadnaA at a glance



www.soundplan.eu/english

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Please enter search word

SoundPLAN

Products and Services | SoundPLAN Acoustics | SoundPLAN Air Pollution | Consulting | Seminars and conferences | About us

SoundPLAN Acoustics

Noise mapping, new noise control concepts, noise mitigation, noise planning. - SoundPLAN is the optimal software solution for all project sizes.

› more

SoundPLAN Air Pollution

Proven scientific air pollution calculation models have been embedded in the SoundPLAN environment and supplemented by specific tools.

› more

http://www.soundplan.eu/english

what's on the market?

- loudspeakersoftware
- acoustic consultancy software:
  Geomilieu (Geonoise)

Geomilieu Help

Verbergen | Vorige | Volgende | Startpagina | Afdrukken | Opties

Inhoudsopgave | Index | Zoeken | Favorieten

Geef op welk trefwoord u wilt zoeken:

puntbron

Punt
Puntbron
Puntenwolk
Puntresultaten
Rails
Railverkeerslawaai
Rasterlijnen
Rechter omweg
Rechthoek
Reductie
Reductiewaarden
Referentie
Reflecterend scherm
Reflecterende bodem
Reflectie
Reflecties
Reflection factor
Reken client
Reken- en rekenvoorschrift
Rekencapaciteit
Rekenen
Rekenjob
Rekenmethode
Rekenmethoden
Rekenparameters
Rekenvoorschrift
Rekenvoorschriften
Resolutie
Resultaten
Resultaten exporteren
Resultatenopslag
Resultatentabel
Rijksdriehoekscoördinaten
Rijlijn
RLM2
RMR
RMR-1996
RMV
RMV-1981
RMV-2002
Rotate
Roteren
Route
Samengestelde periode
samenvoegen
Samenvoeging industrielawaai
Schaal
Scherm
Schermweking
Screening
Screening attenuation
Select
Select items of active group
Selecteer actieve groep
Selecteer items
Selecteer items actieve groep
Selecteer server
Selecteren
Selectie
Selectie eigenschappen
Selectie van items
Selection

Weergeven

Puntbron (IL, ISO-industrie, Harmonoise)

Top Previous Next

Inhoudsopgave » Bronnen » Industrie bron » Bronnen » Puntbron

Omschrijving
Een puntbron wordt gebruikt voor het modelleren van industriële geluidsbronnen.

Uitwerken van metingen naar bronvermogens
Bij het uitwerken van metingen naar bronvermogens moet al een keuze zijn gemaakt over hoe de bron zal worden ingevoerd. Om dit te verduidelijken, kan als voorbeeld de geluidsemissie van een afstralende wand worden beschouwd. Het immissierelevante bronvermogen van een wand bestaat uit de som van het gemeten bronvermogen en de richtingsindex (DI). In de dominante uitstralingsrichting krijgt de DI een waarde van 3 dB. Deze wand kan worden gemodelleerd met normale puntbronnen die al of niet zijn gekoppeld aan het gebouw of door gevelbronnen:

- Een normale bron die niet is gekoppeld aan de gevel ("Negeer reflectie in gebouw" uit uitgevinkt) heeft naast een directe bijdrage tevens een bijdrage van reflectie in het gebouw. Door de reflectie krijgt deze bron een DI van 2.5 dB (bij een reflectiecoefficient van 0.8) naar voren toe. Om een uiteindelijk DI van 3 dB te bereiken dient het bronvermogen met 0.5 dB te worden verhoogd.
- Indien de optie "Negeer reflectie in gebouw" is aangevinkt (ie. de bron wordt gekoppeld met het gebouw), dan wordt de reflectie niet beschouwd. Het bronvermogen moet nu met 3 dB worden verhoogd om in de dominante uitstralingsrichting een juist DI te simuleren.
- Wordt de bron ingevoerd als afstralende gevel, dan moet er geen correctie voor de DI in het bronvermogen worden toegepast. In dit geval wordt de DI verwerkt in de overdrachtsberekening.

Tab *Eigenschappen*

Brontype
In het geval van de module IL kan voor brontype worden gekozen uit 'normale puntbron', 'afstralende gevel', 'afstraland dak IL-HR-13-01 CB' of 'afstraland dak HMRI-IL8'.
Bij module ISO kan gekozen worden uit 'normale puntbron', 'afstralende gevel' en 'afstraland dak'.

Openingshoek [grd]
Uitstralingsrichting [grd]
Wanneer bij brontype voor een normale puntbron wordt gekozen, kan de emissierichting ingesteld worden. De emissie wordt bepaald door een 'Openingshoek' en een 'Uitstralingsrichting'. Deze hoeken worden uitgedrukt in graden volgens de kompasrichtingen.

Bij een openingshoek van 360 graden (rondom uitstraland) kan geen 'Uitstralingsrichting' worden ingevoerd.
Wanneer voor een afstralende gevel of afstraland dak wordt gekozen, kunnen er geen emissierichtingen ingesteld worden (de bijbehorende invoervelden zijn grijs, de 'Openingshoek' is 360 en de 'Uitstralingsrichting' is 0).

Negeer reflectie
Indien geen reflectie in de dichtstbijzijnde zijde van een gebouw mag worden berekend, kan 'Negeer reflectie' aangevinkt worden.

Negeer gebouw
Indien gebouwen waarbinnen de bron zich bevindt geen effect hebben op de geluidsoverdracht van bron naar ontvanger kan 'Negeer gebouw' worden aangevinkt.

Negeer procesinstallatiegebied
Indien procesinstallatiegebieden waarbinnen de bron zich bevindt geen effect hebben op de geluidsoverdracht van bron naar ontvanger kan deze optie worden aangevinkt.

Tab *Emissie*

Reductie
Specifieke maatregelen met een gestandaardiseerde demping.

Lw [dB]
Het A-gewogen bronvermogen per octaafband ('Lw[dB(A)]') van de puntbron.

Reductie per octaafband [dB]
Dempingswaarden per octaafband. Er kan voor een specifieke maatregel met een gestandaardiseerde demping gekozen worden, of een eigen demping worden ingevoerd.

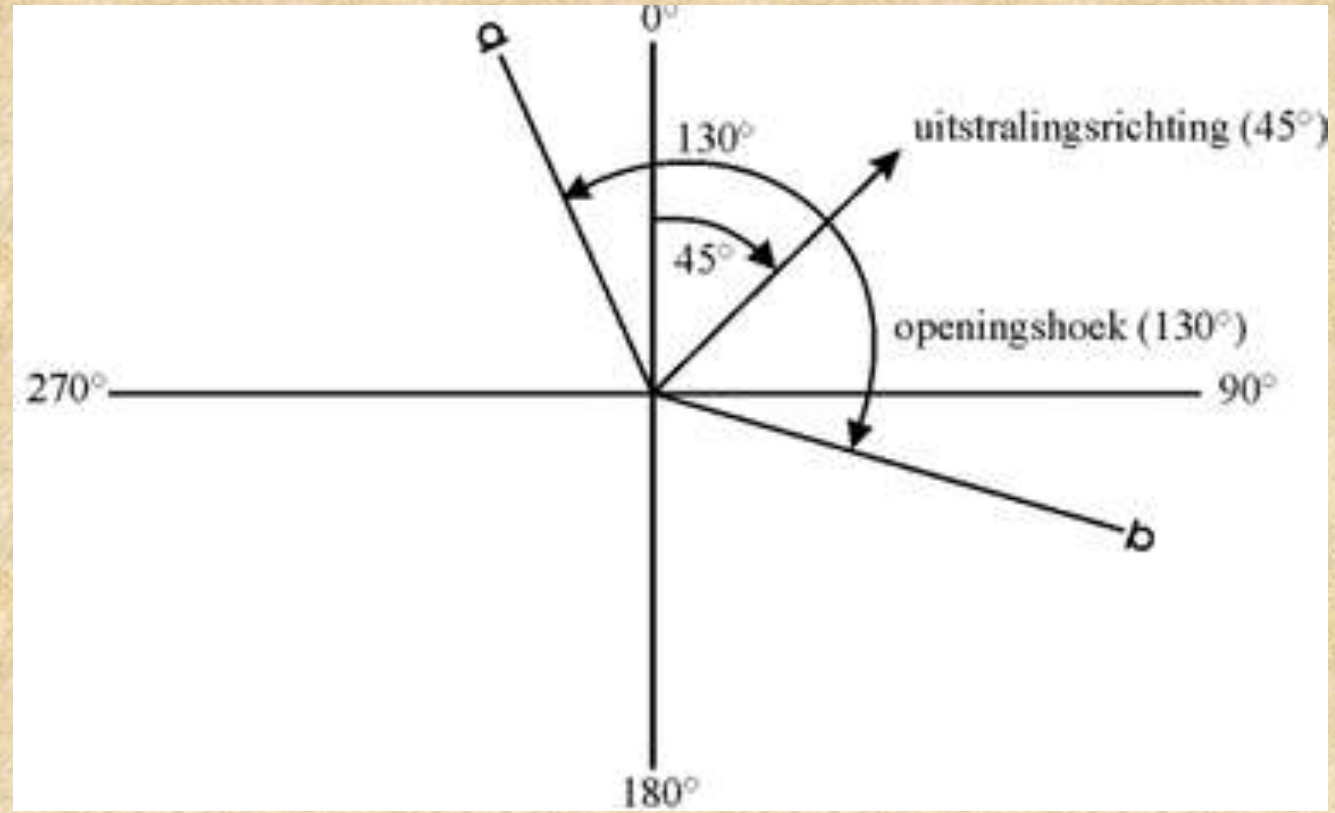
[Toepassen A-weging]
Indien de ingevoerde bronvermogen nog niet is A-gewogen kan middels deze knop als nog de A-wegen worden toegepast

Tab *Bedrijfstijden*

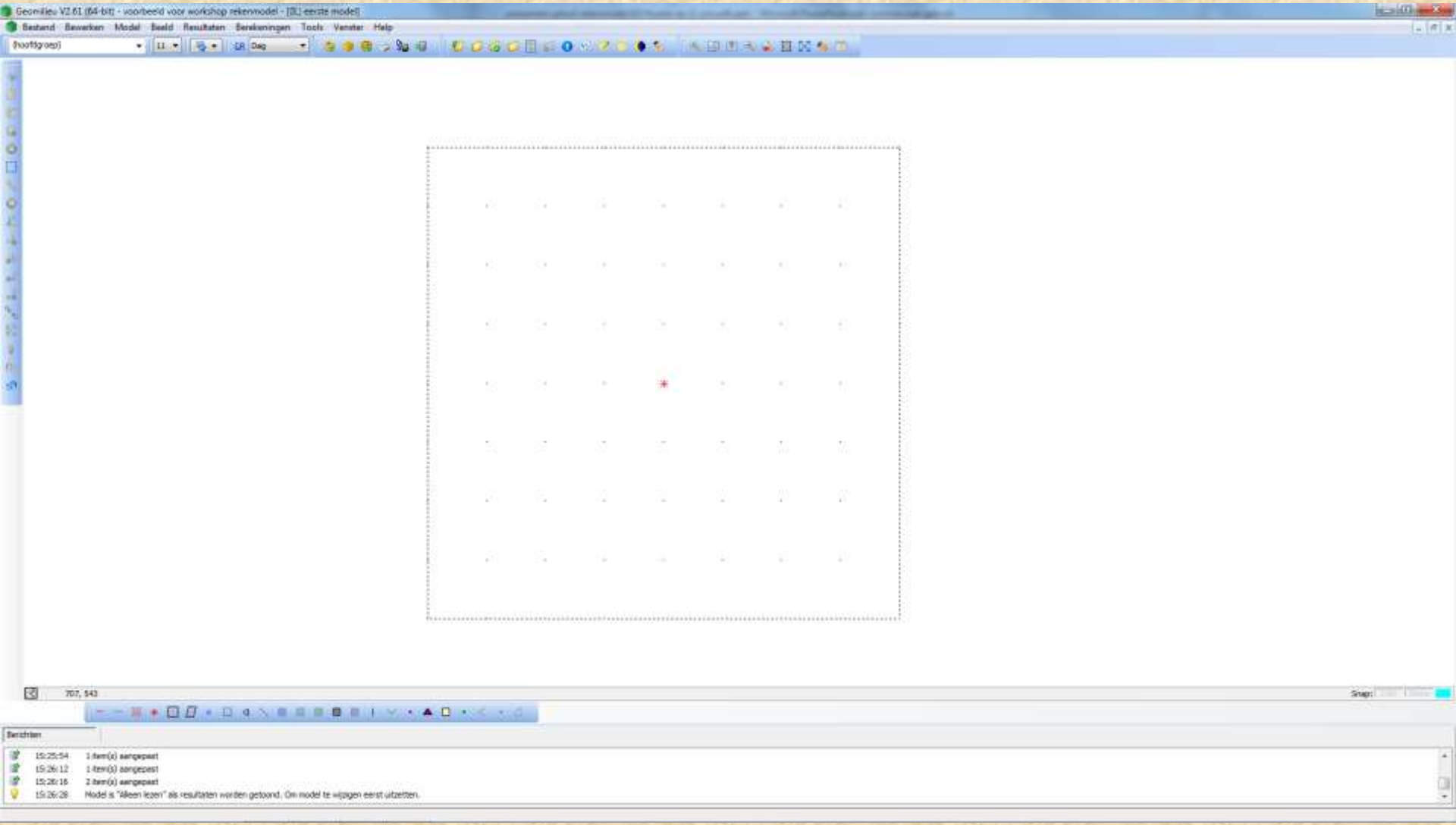
Uren
Aantal uur per periode dat een bron in bedrijf is.

Percentage
Percentage van de periode (kan worden ingevuld, of worden berekend indien een waarde bij "Uren" wordt opgegeven).

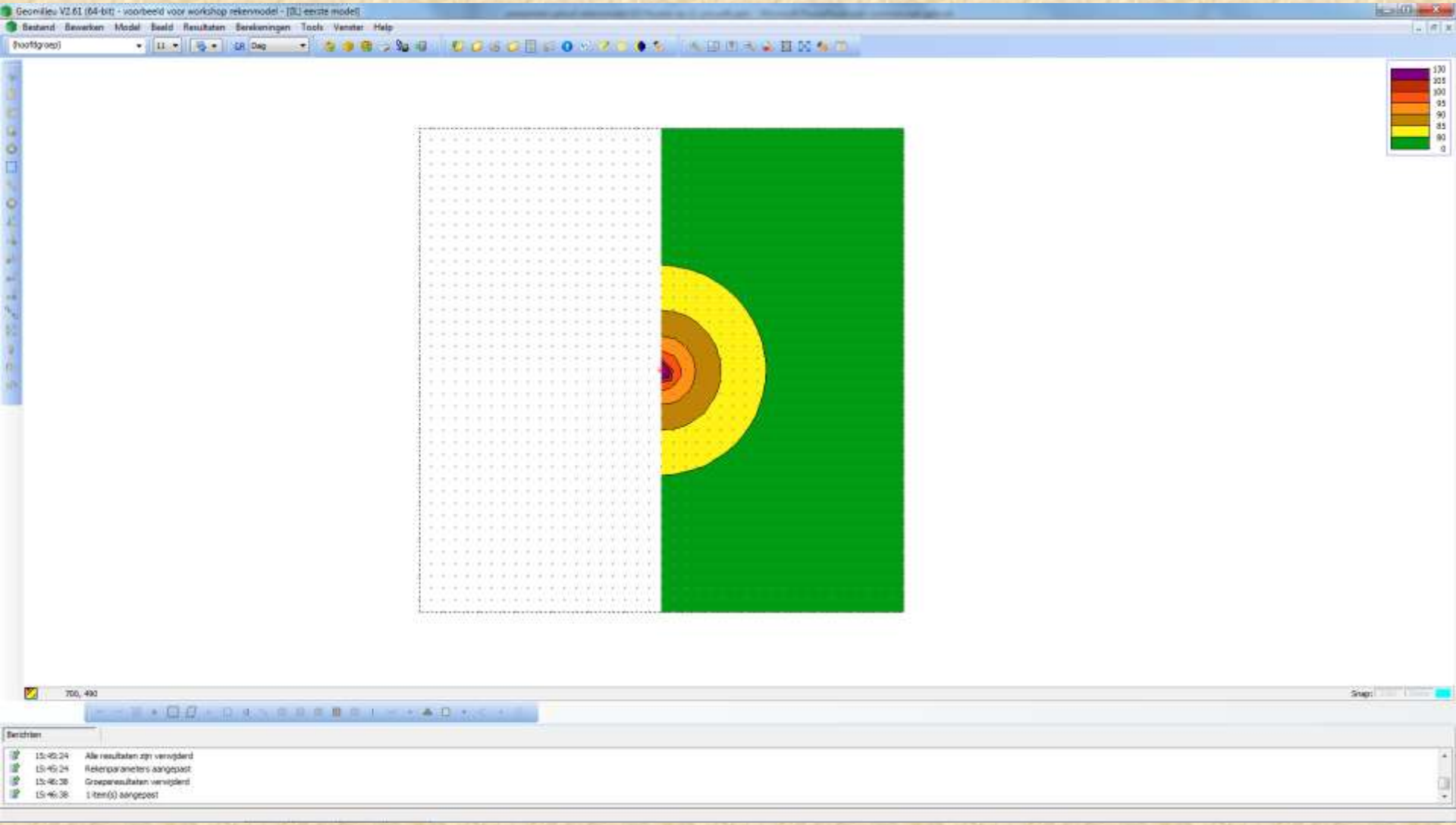
Reductie [dB]
Reductie per periode (kan worden ingevuld, of worden berekend indien een waarde bij "Uren" wordt opgegeven). Bij de invoer van een reductie in dB zijn ook de tijdstippen van de afzonderlijke periodes belangrijk (dag, avond en nacht). Deze tijdstippen kunnen met een afzonderlijk formulier via de menu-optie Model | Definieer Perioden worden aangepast.
De formule voor de bedrijfsduurcorrectie is als volgt:


0°
a
130°
uitstralingsrichting (45°)
45°
openingshoek (130°)
270°
90°
b
180°

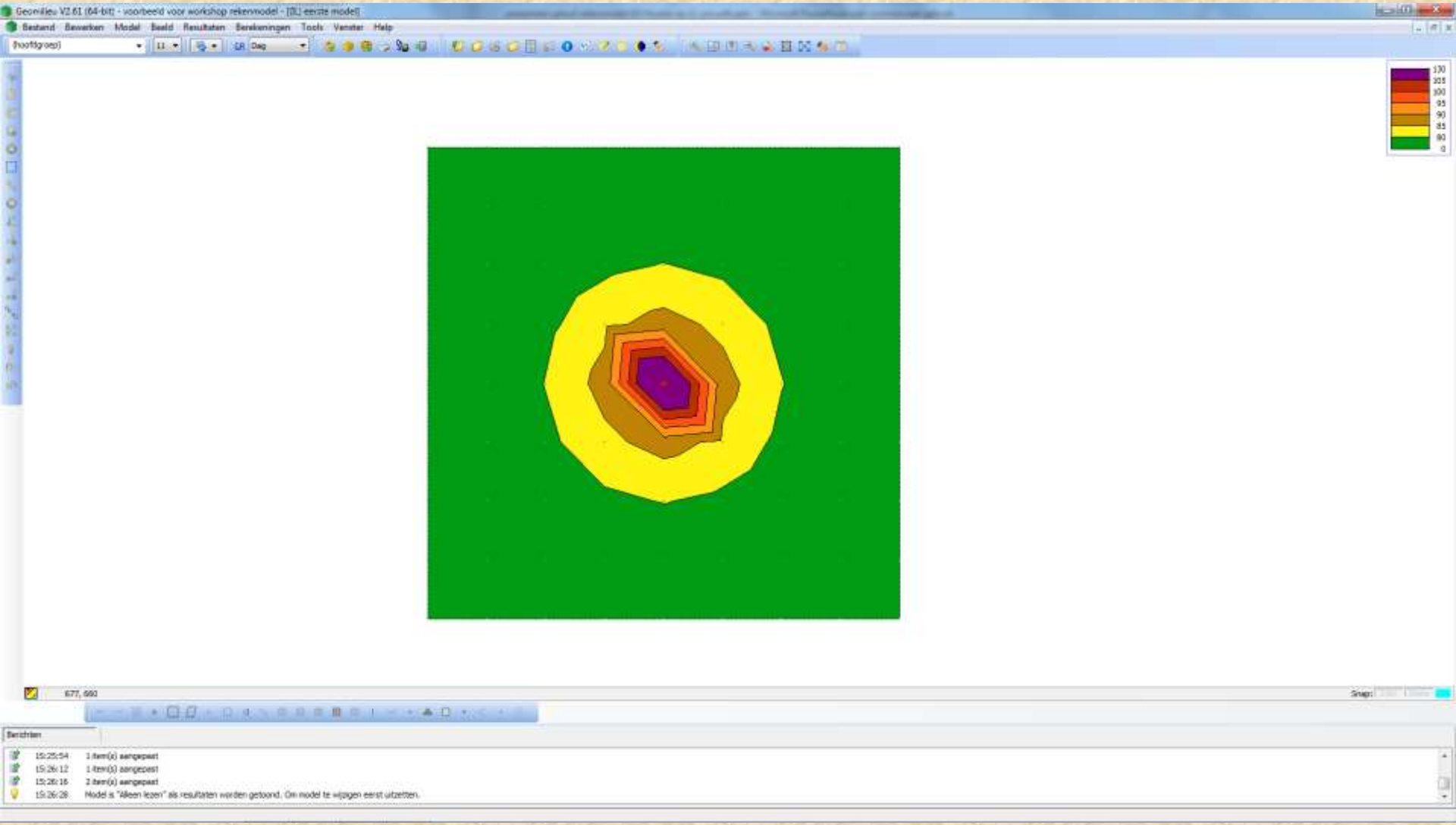
example: point source, 5 meter height, grid 200 x 200 meter resolution 50 m.



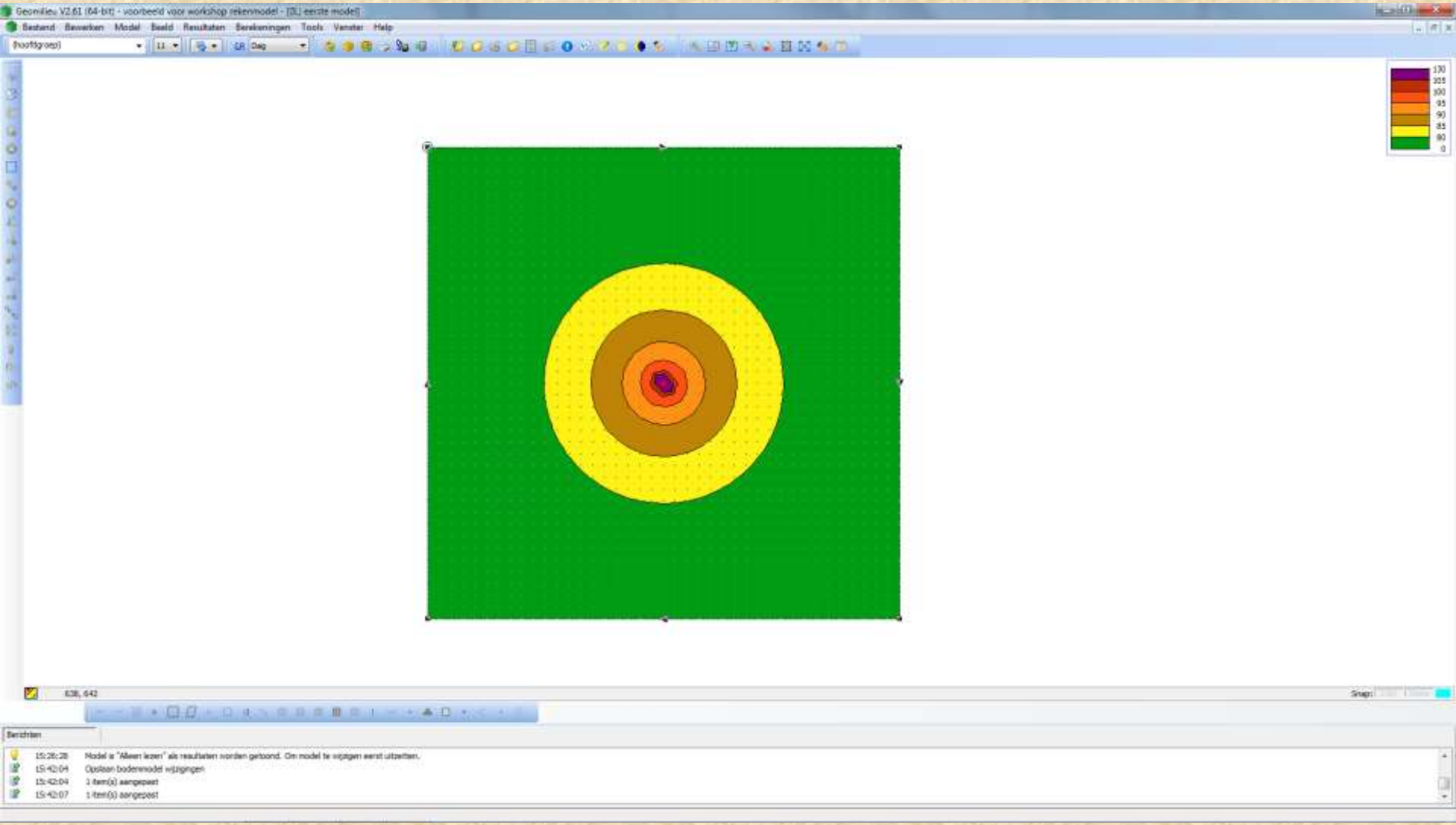
example: forward direction = 90 degrees, aperture = 180 graden



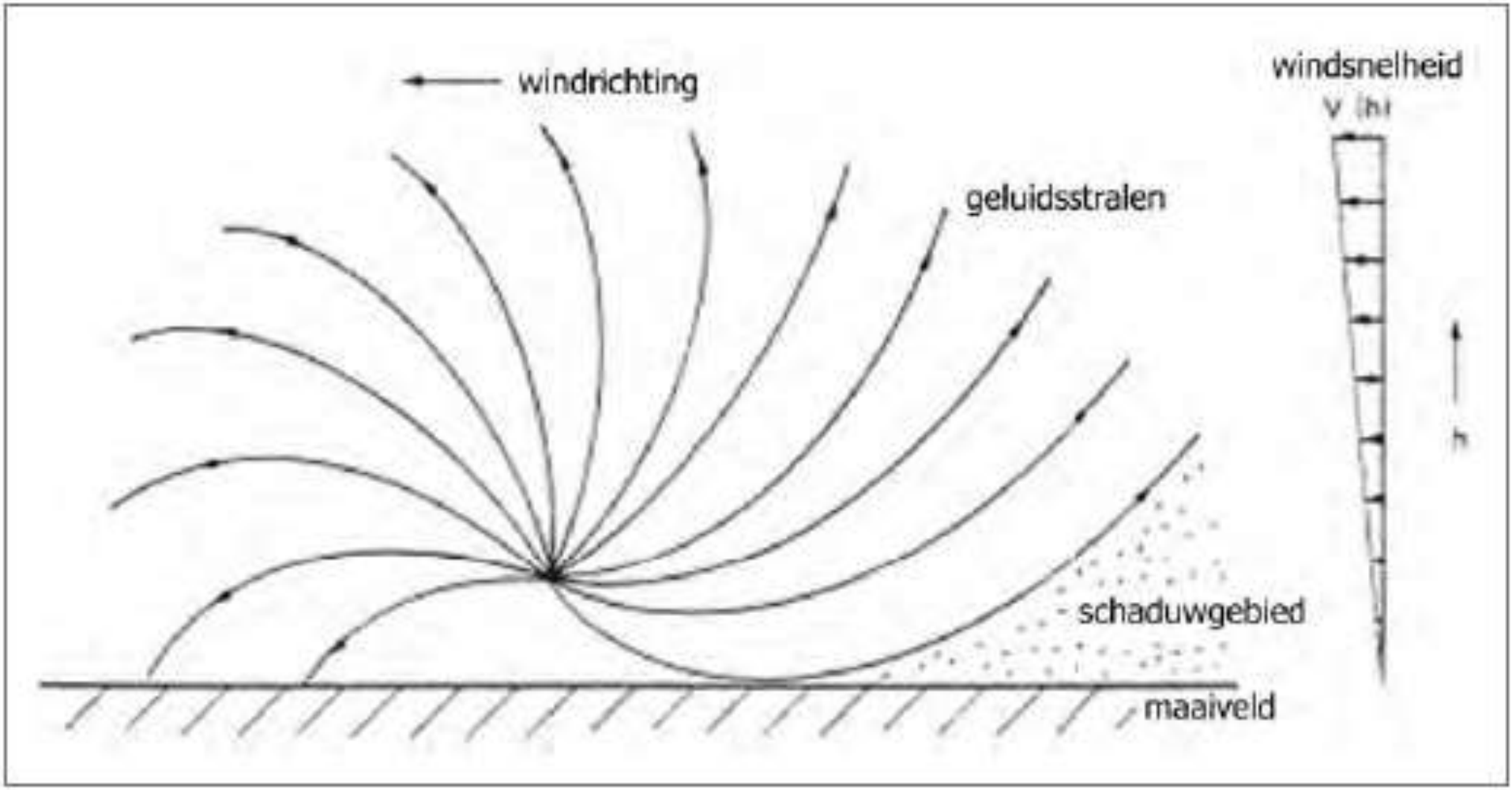
example: gridresolution 50 m.

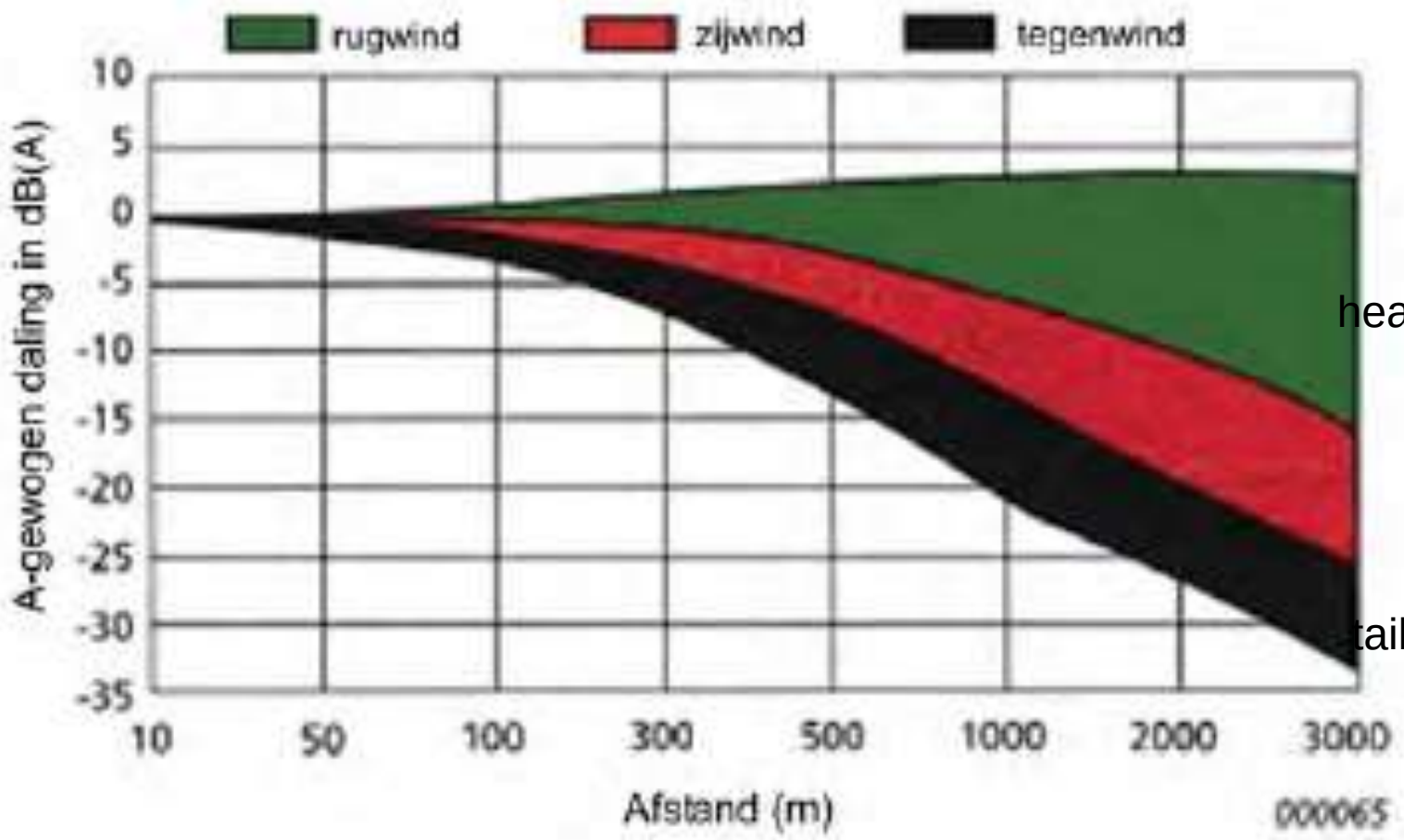


example: gridresolution 10 m.



preparation (winter time) : decibel model, environment


windrichting
windsnelheid
V (h)
geluidsstralen
schaduwgebied
maaiveld
h



headwind

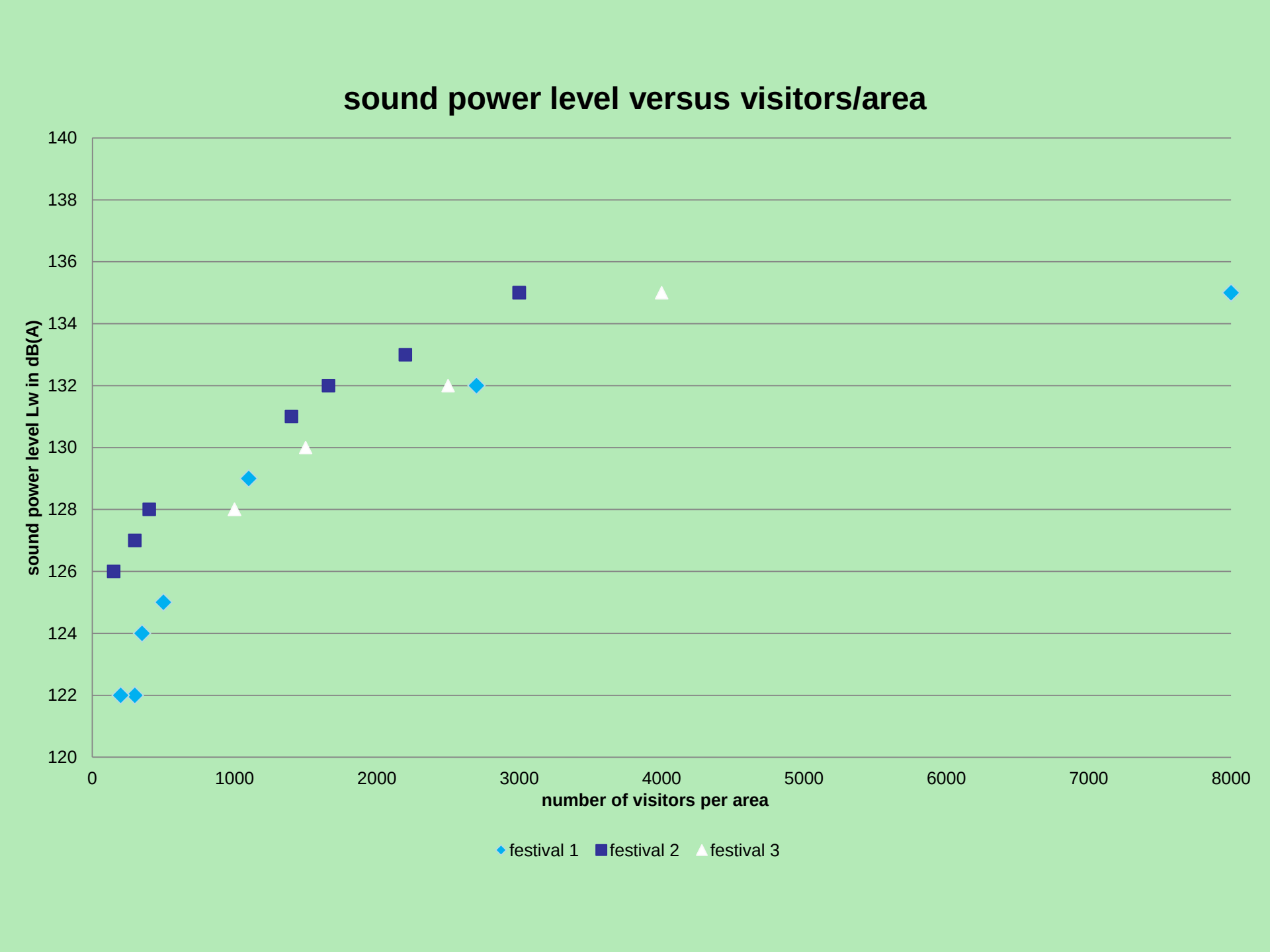
tailwind

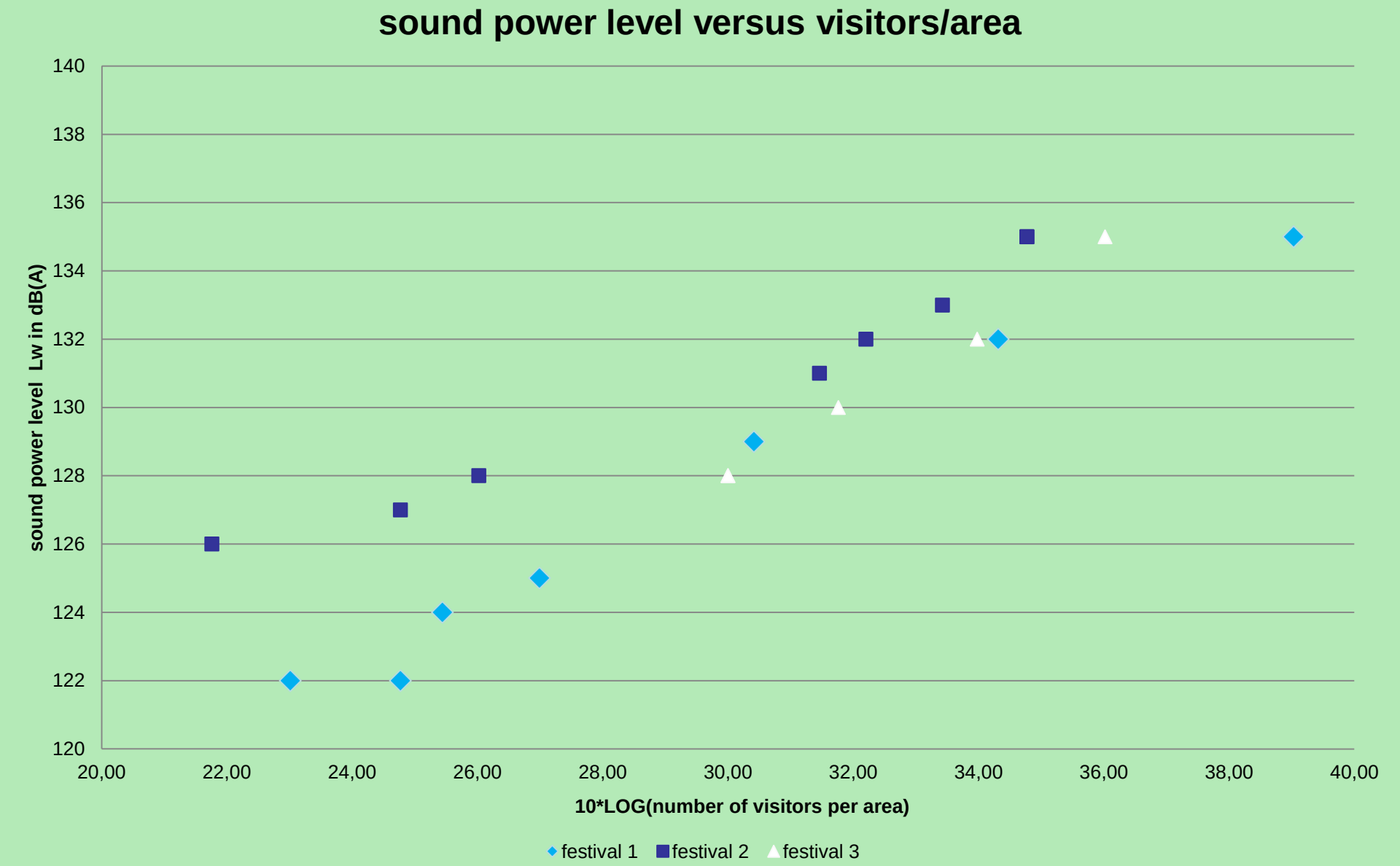
Cmeteo yes or no?

modelling of the source:

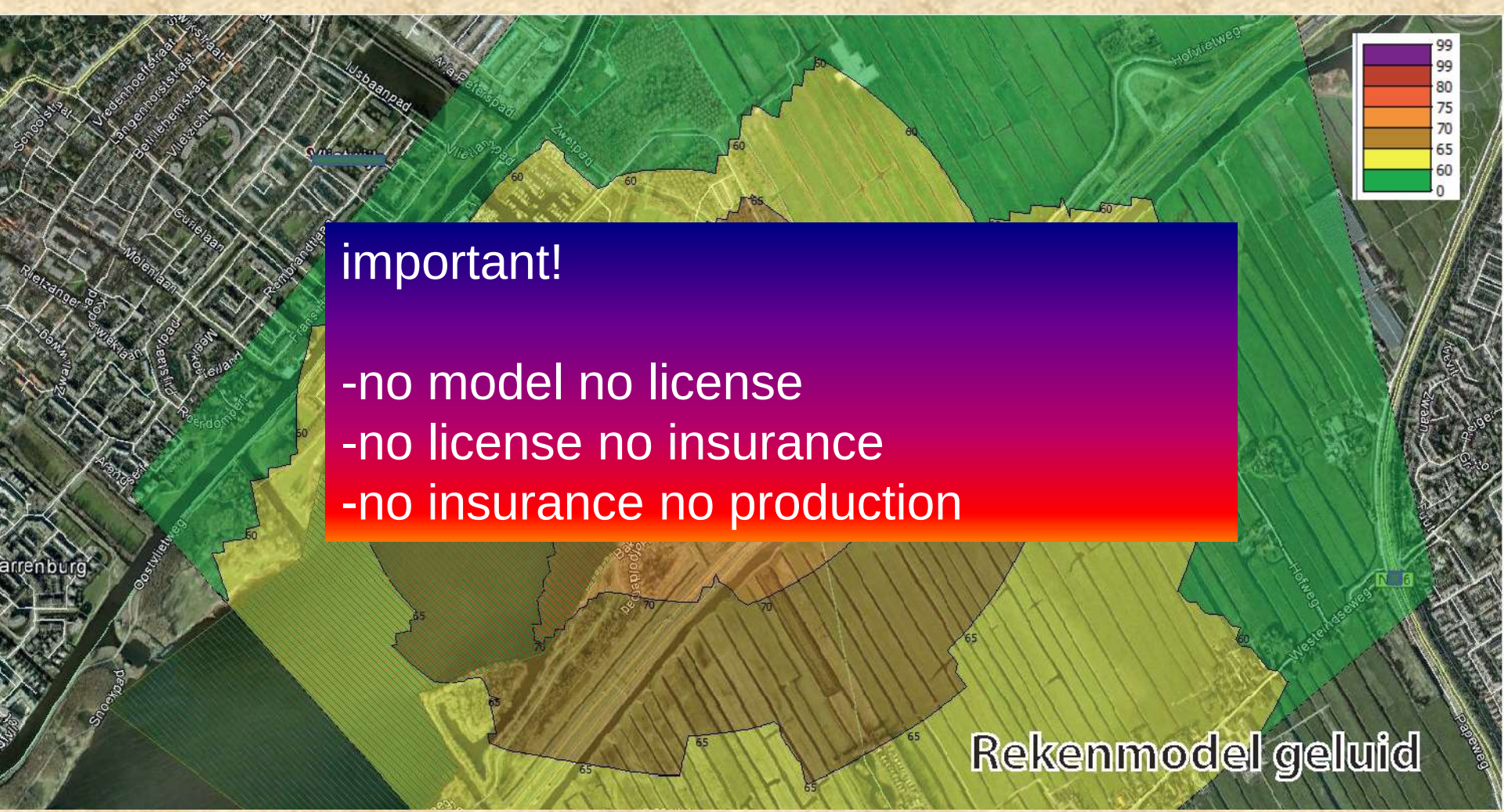
sound power level is important:

L_w from 120 to 140 dB

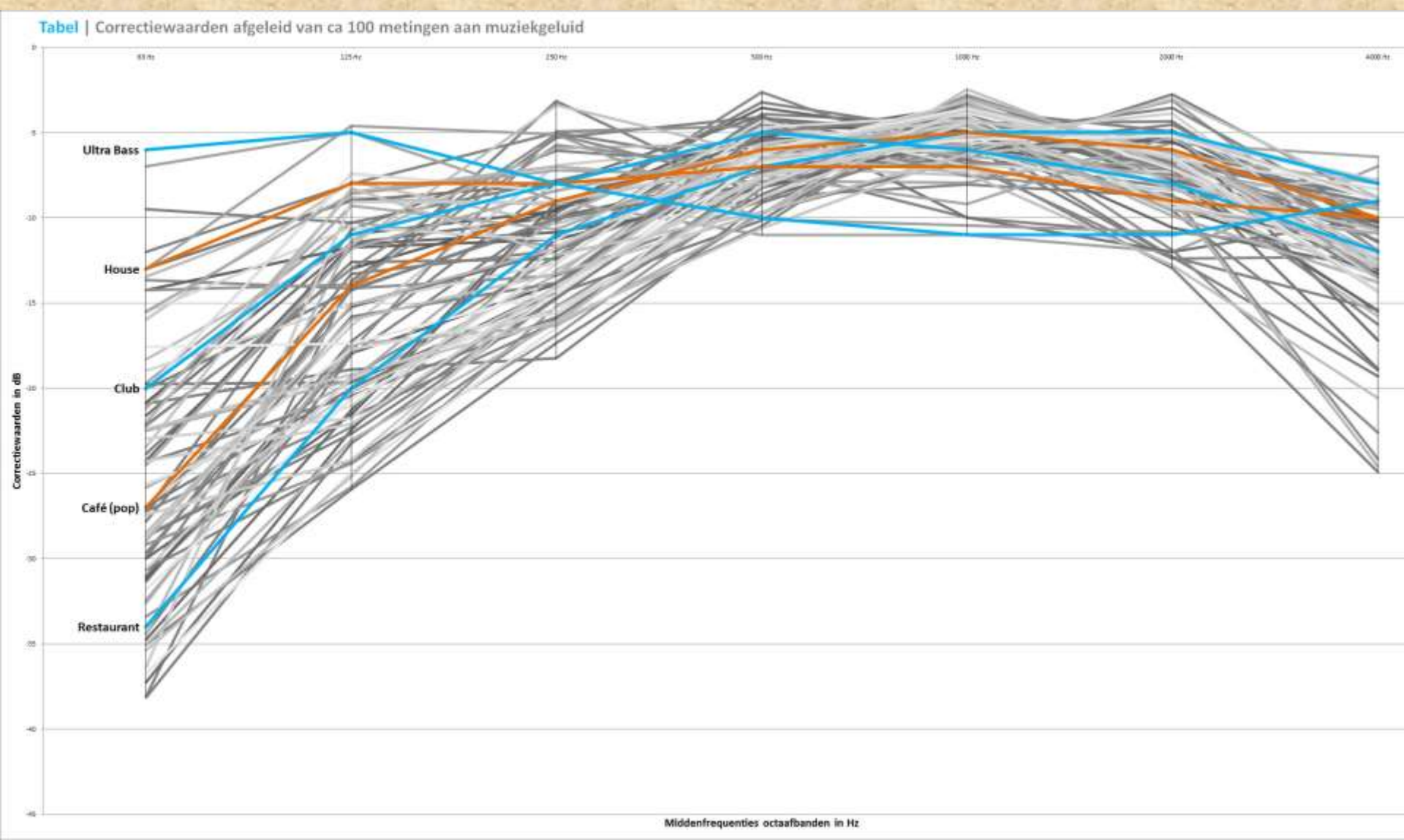

sound power level versus visitors/area
sound power level Lw in dB(A)
140
138
136
134
132
130
128
126
124
122
120
0
1000
2000
3000
4000
5000
6000
7000
8000
number of visitors per area
festival 1
festival 2
festival 3


sound power level versus visitors/area
140
138
136
134
132
130
128
126
124
122
120
sound power level Lw in dB(A)
20,00
22,00
24,00
26,00
28,00
30,00
32,00
34,00
36,00
38,00
40,00
10*LOG(number of visitors per area)
festival 1
festival 2
festival 3

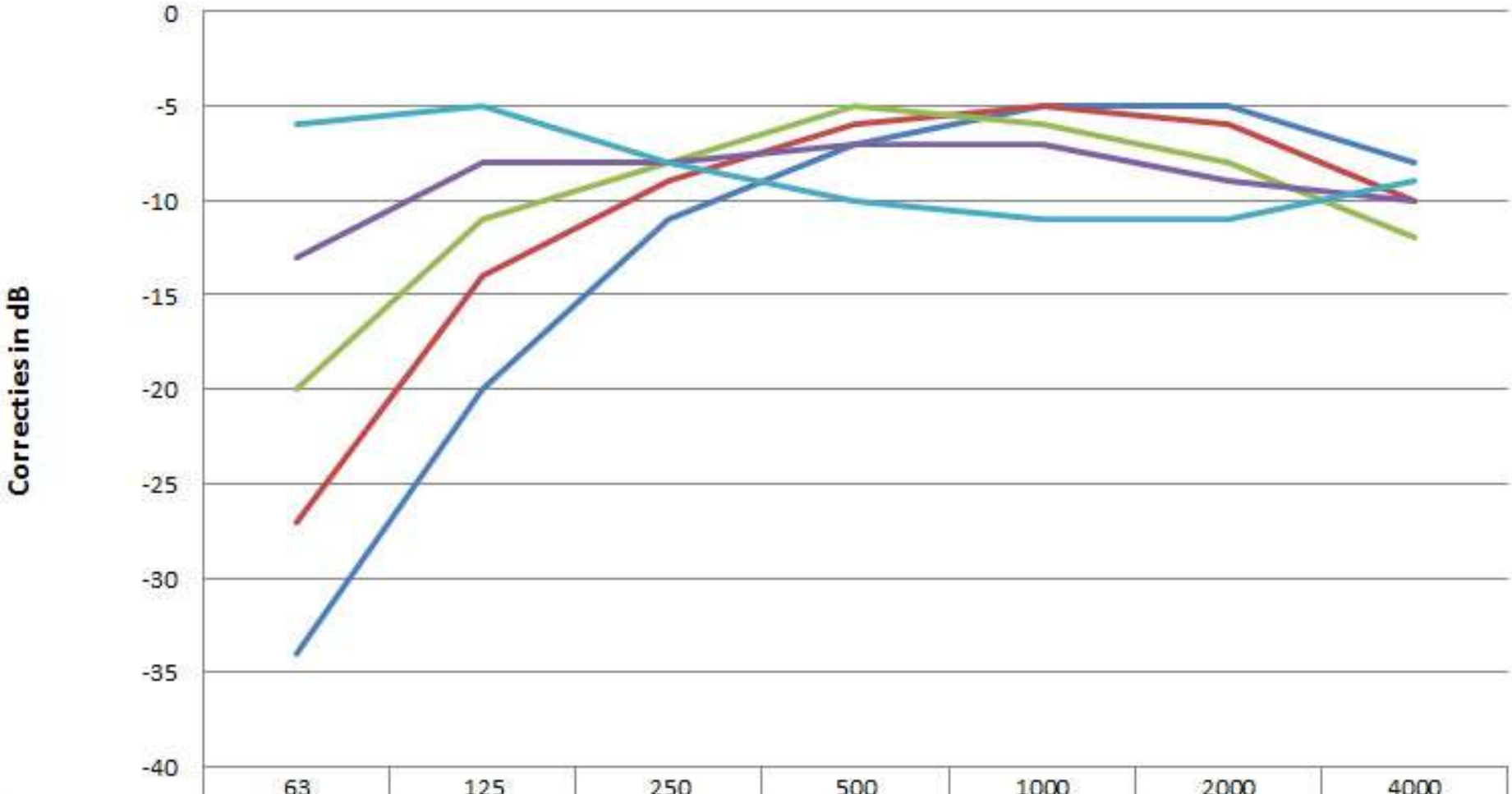
preparation (winter time) : decibel model, environment



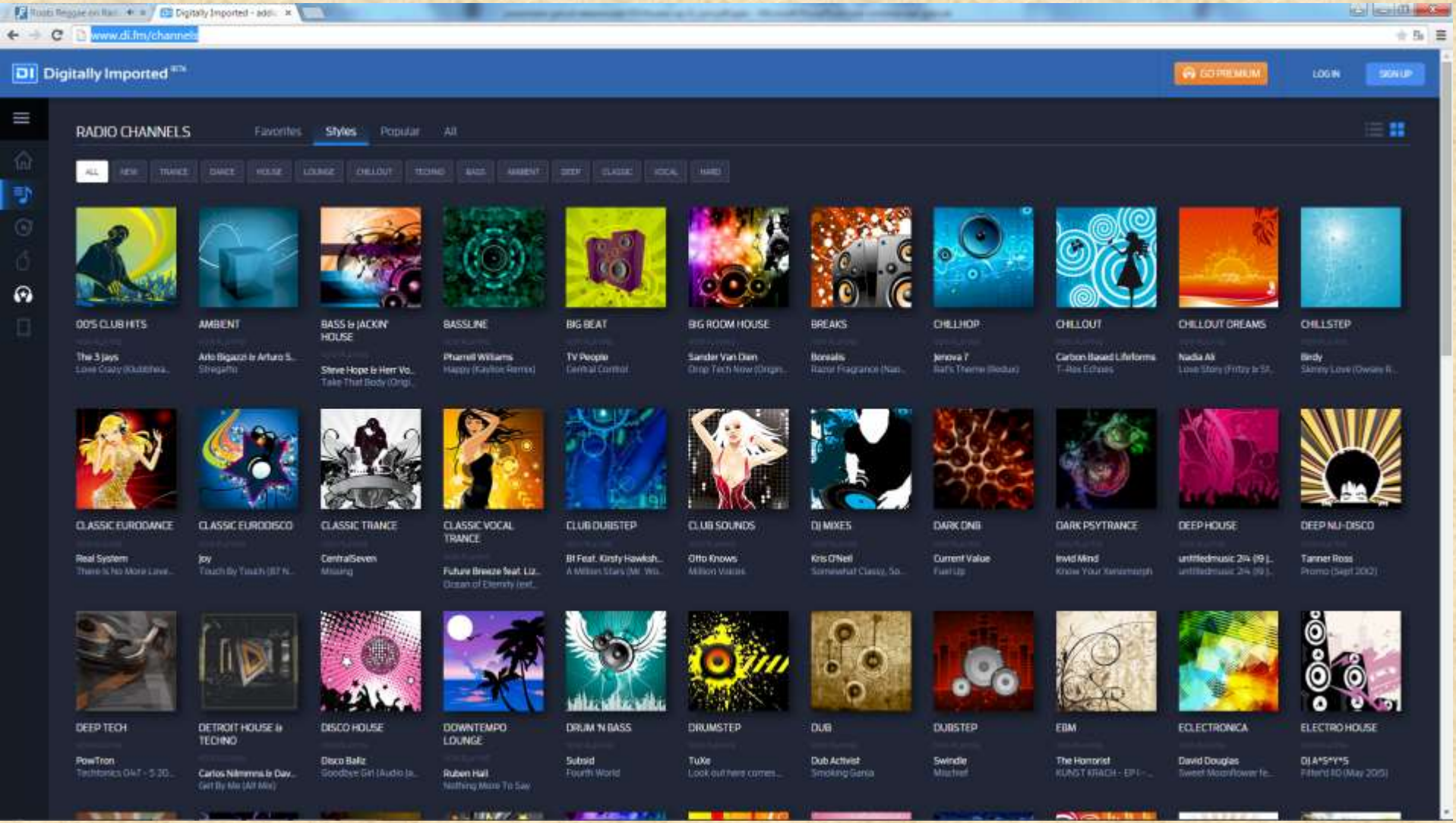
-what is important:
1) sound power level
2) spectrum



Tabel | Correcties muziekspectra

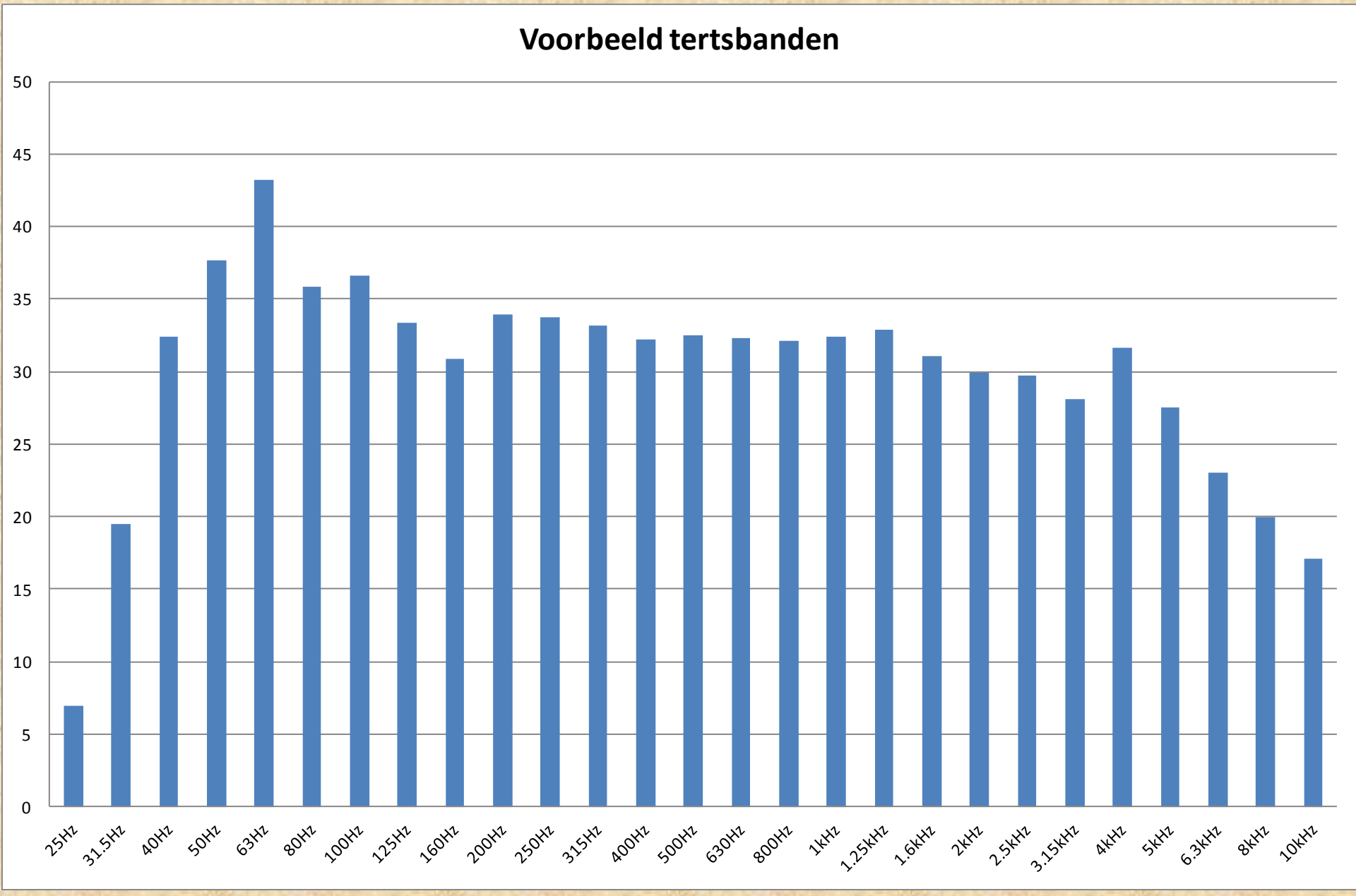


	63	125	250	500	1000	2000	4000
Restaurant	-34	-20	-11	-7	-5	-5	-8
Café (pop)	-27	-14	-9	-6	-5	-6	-10
Club	-20	-11	-8	-5	-6	-8	-12
House	-13	-8	-8	-7	-7	-9	-10
Ultra bass	-6	-5	-8	-10	-11	-11	-9



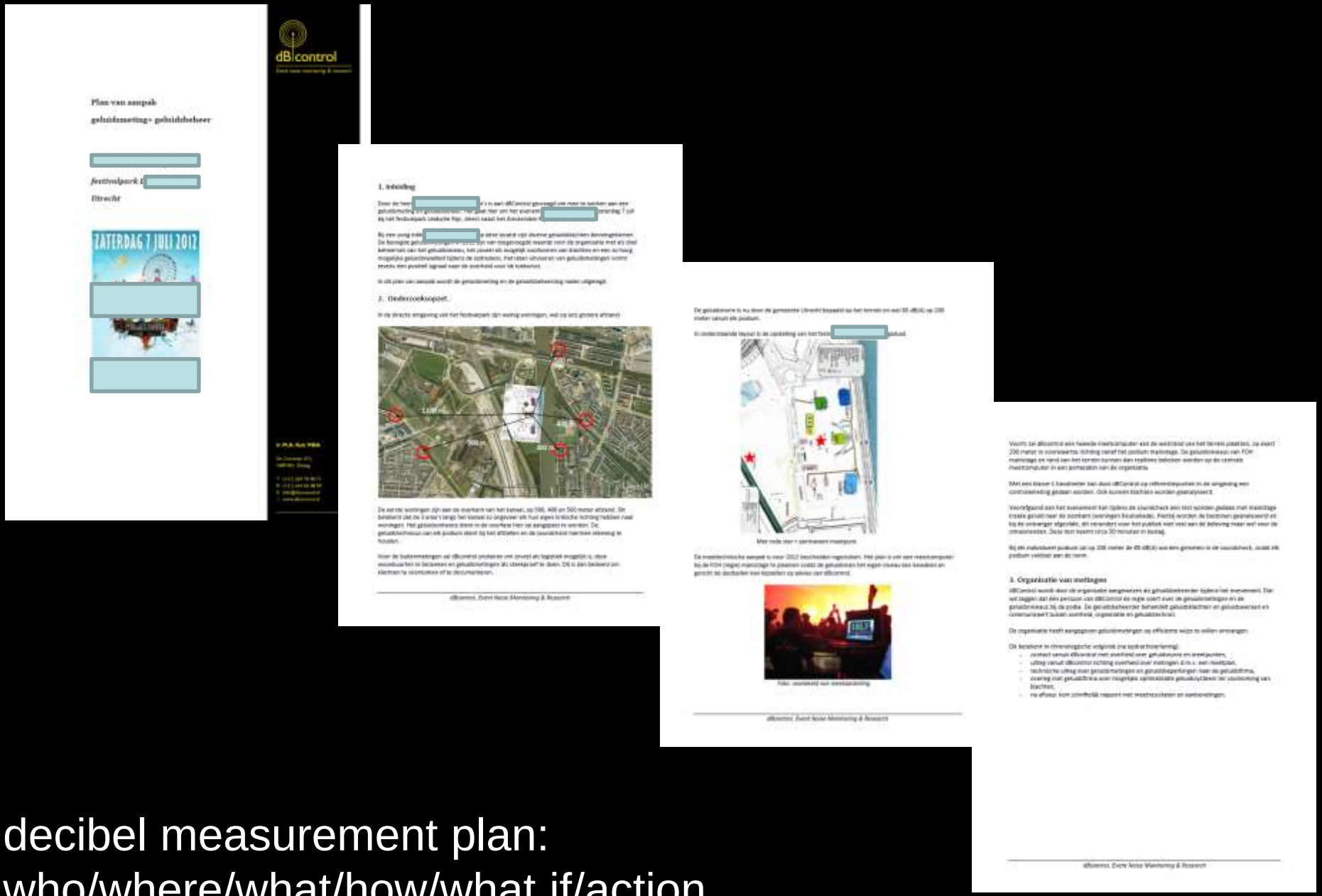
http://www.di.fm/channels

84 different radiochannels with dance music


Voorbeeld tertsbanden
50
45
40
35
30
25
20
15
10
5
0
25Hz
31.5Hz
40Hz
50Hz
63Hz
80Hz
100Hz
125Hz
160Hz
200Hz
250Hz
315Hz
400Hz
500Hz
630Hz
800Hz
1kHz
1.25kHz
1.6kHz
2kHz
2.5kHz
3.15kHz
4kHz
5kHz
6.3kHz
8kHz
10kHz

Wednesday:

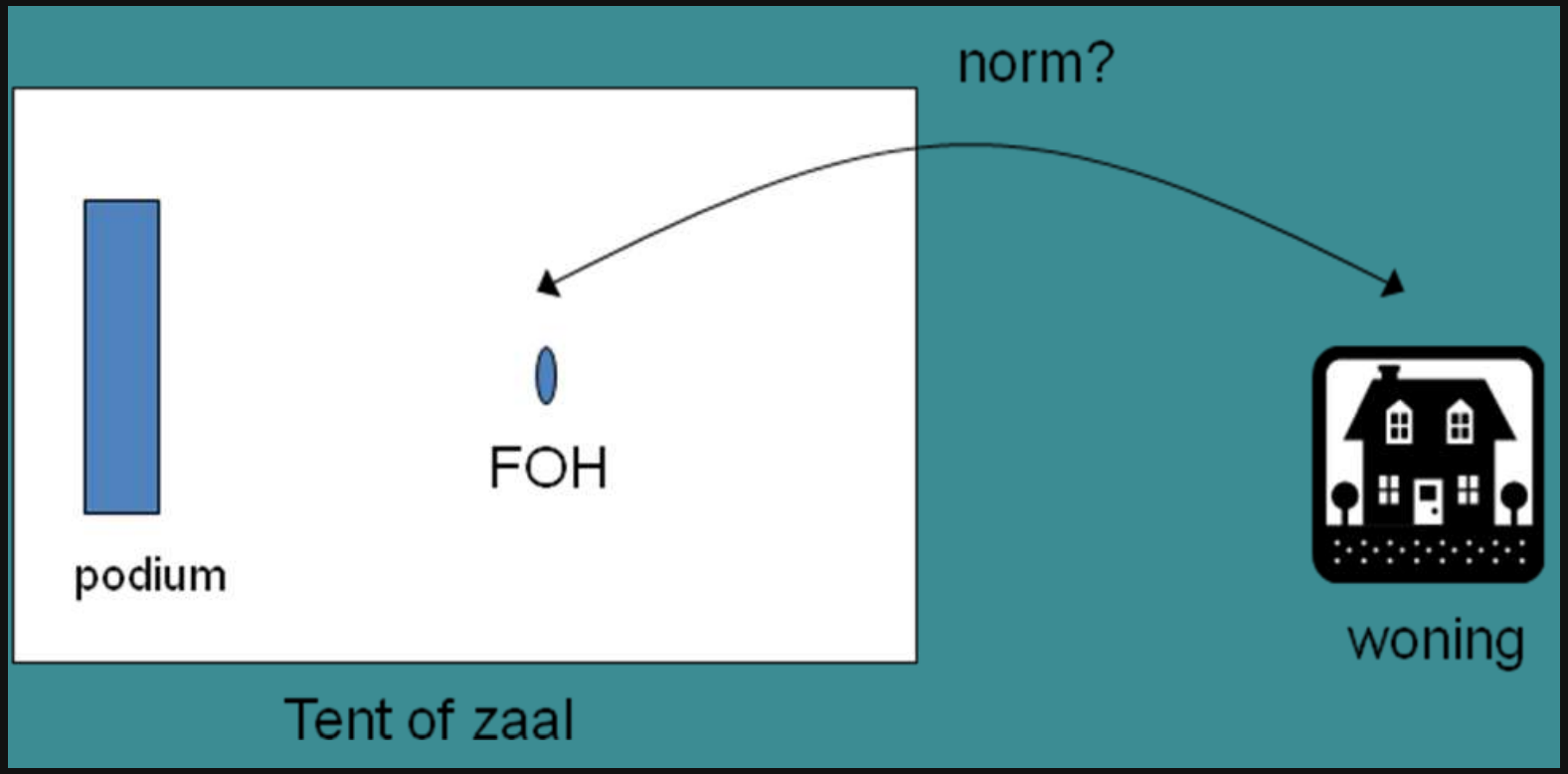
1. introduction
2. world of dBcontrol
3. history and sound level management
4. calculation of sound
5. **decibel measurement plan**



decibel measurement plan:
who/where/what/how/what if/action

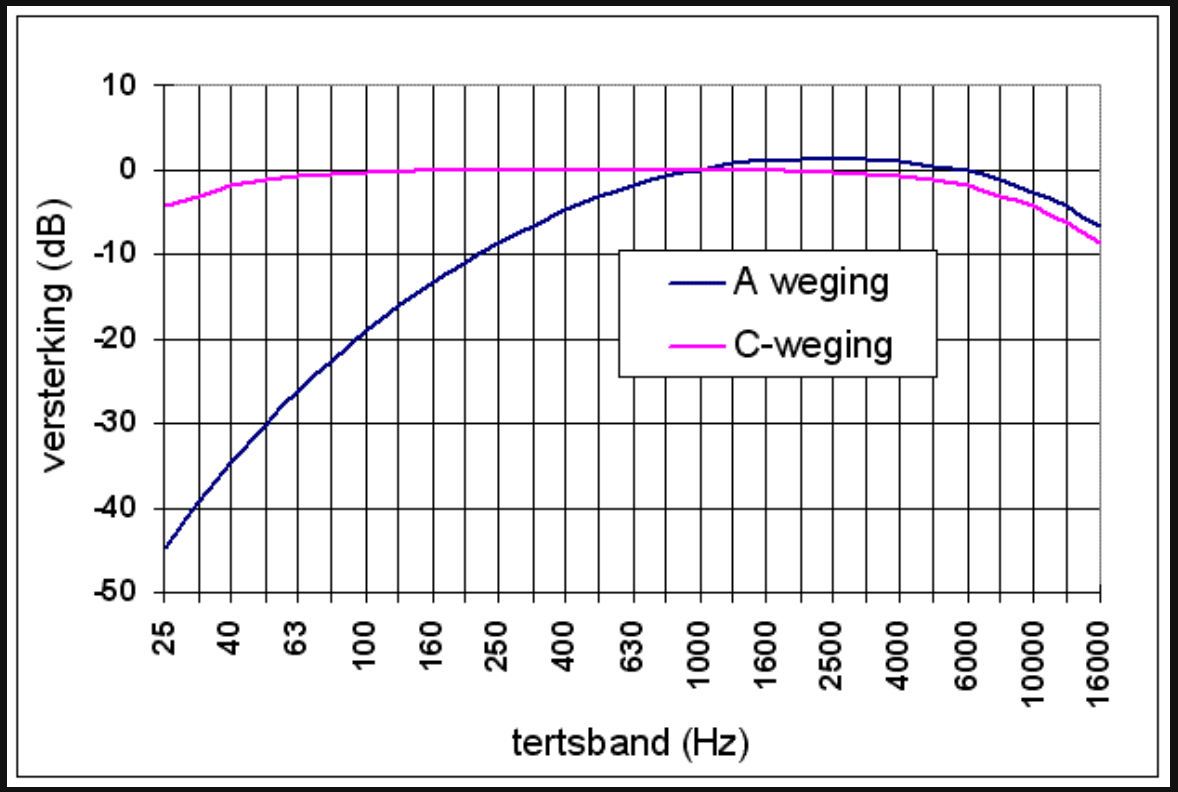
Measurement plan:

1) location of microphone?



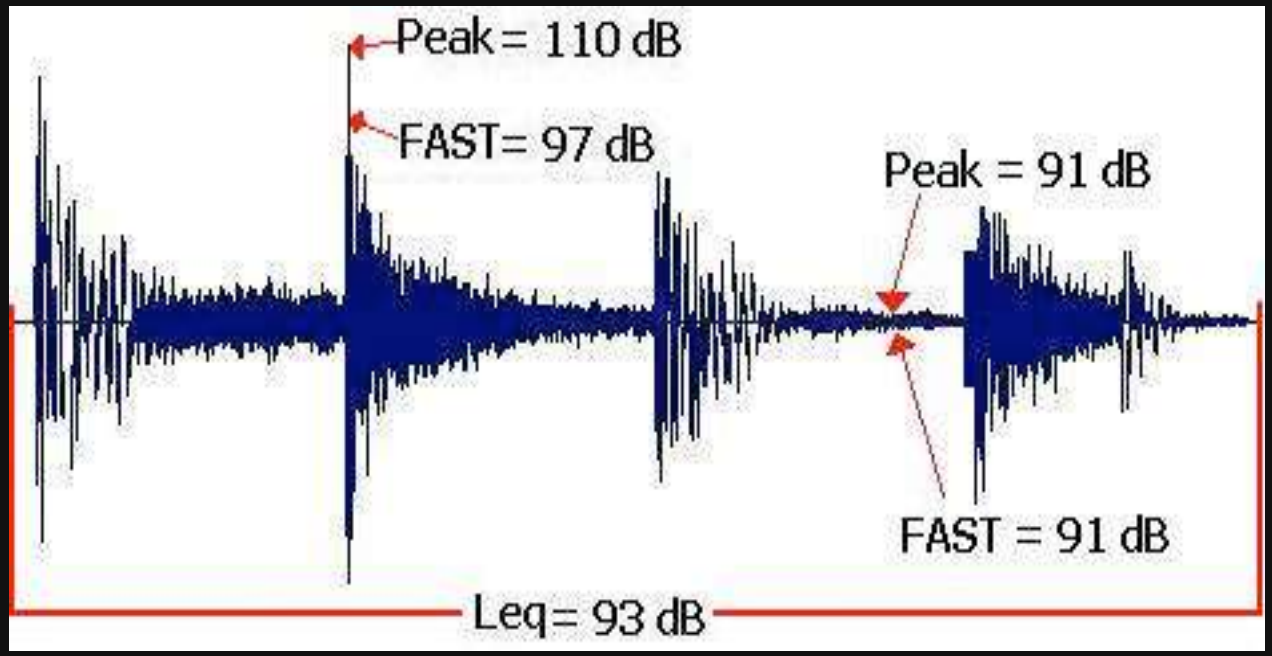
Meten:

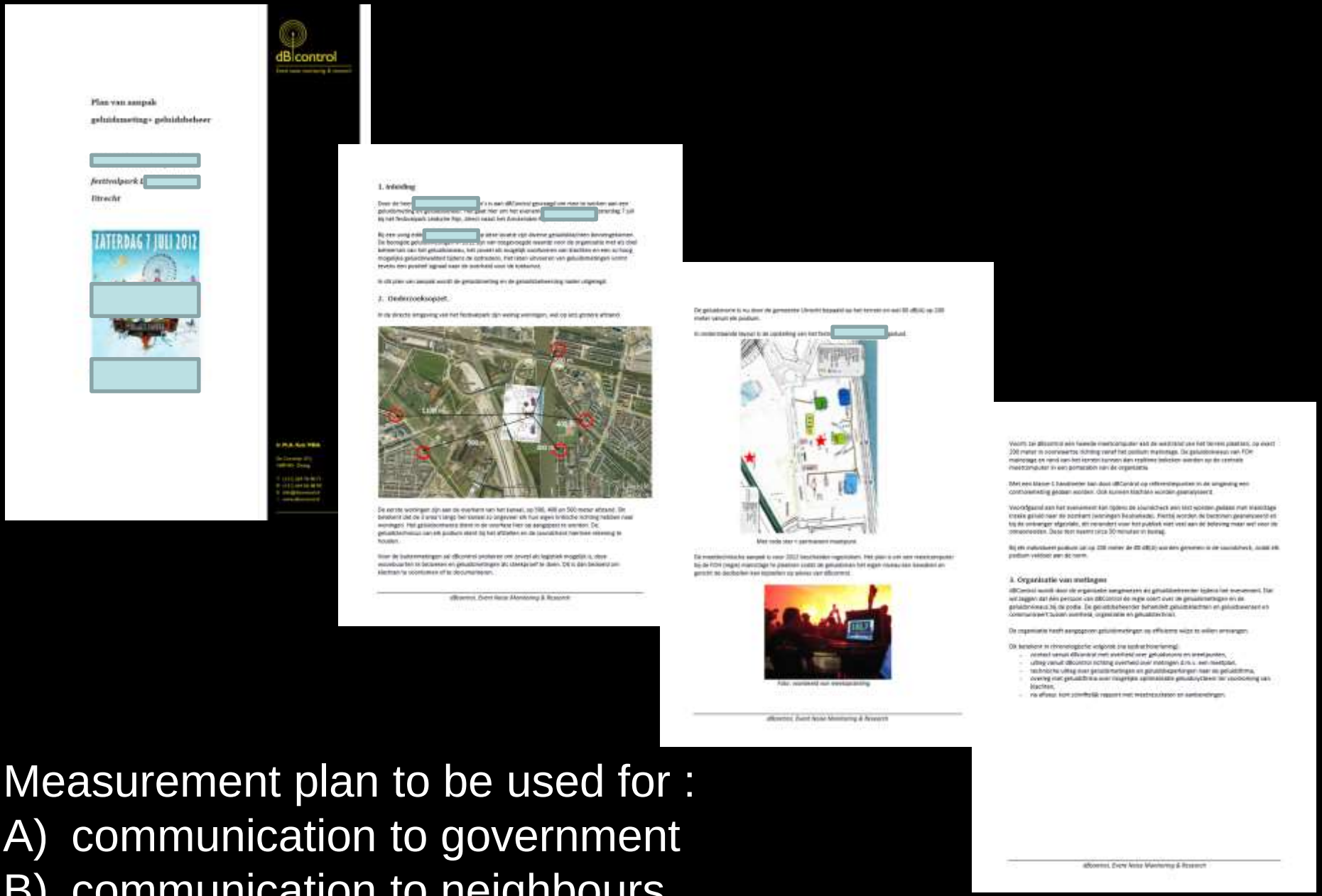
1) location?
2) height?
3) timeframe?
4) A-weighting or C-weighting?
5)



Measurements:

1) location?
2) height?
3) timeframe?
4) A-weighting or C-weighting?
5) parameter: Leq, Lmax, Lpeak, L95, SEL?



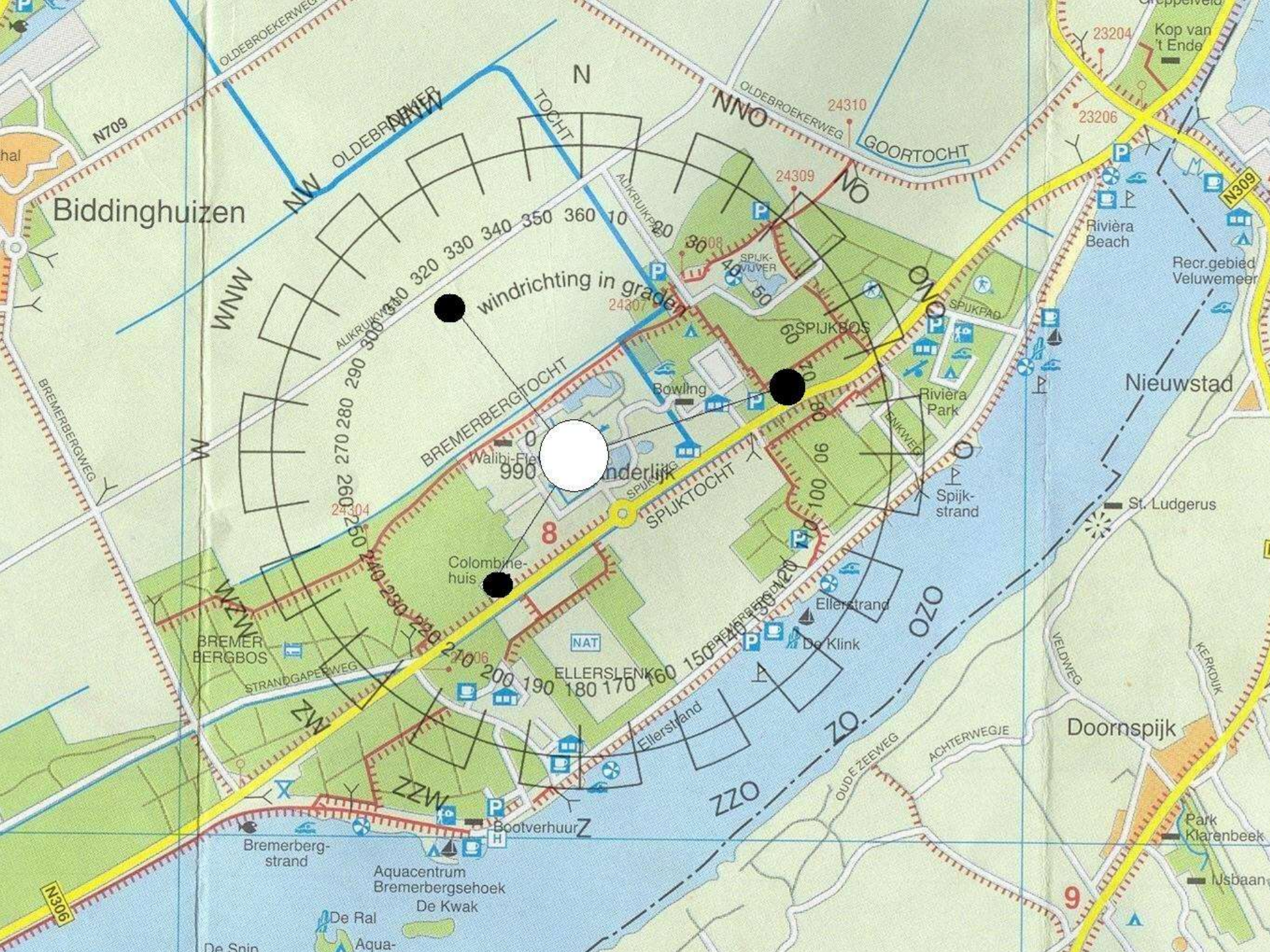


Measurement plan to be used for :

A) communication to government
B) communication to neighbours
C) communication to (famous) artists

HIGHER GROUND
ECHO
ALPHA
JULIET
INDIA
DOMMELSCH
GOLF
INGANG
BRAVO

CASE study



Biddinghuizen
N709
OLDEBROEKERWEG
OLDEBROEKERWEG
GOORTOCHT
TOCHT
N
NNO
NO
ONO
O
OZO
ZO
ZZO
Z
ZZW
ZW
WZW
W
WNW
NW
NNW
windrichting in graden
BREMERBERGTOCHT
SPIJKTOCHT
SPIJKBOS
SPIJKPAD
SPIJK-VIJVER
ALIKRUIKPAD
ALIKRUIKWEG
BREMERBERGWEG
Bowling
Walibi-Flevo
Colombine-huis
BREMER BERGBOS
STRANDGAPERWEG
ELLERSLENK
NAT
Ellerstrand
De Klink
Spijk-strand
Rivièra Park
Rivièra Beach
Recr.gebied Veluwemeer
Nieuwstad
St. Ludgerus
Doornspijk
Park Klarenbeek
IJsbaan
VELDWEG
KERKDIJK
ACHTERWEGJE
OUDE ZEEWEG
Bootverhuur
Bremerberg-strand
Aquacentrum Bremerbergsehoek
De Kwak
De Ral
Aqua-
De Spin
N306
N309
Kop van 't Ende
23204
23206
24310
24309
24307
24304
24306
8
9

measurement position

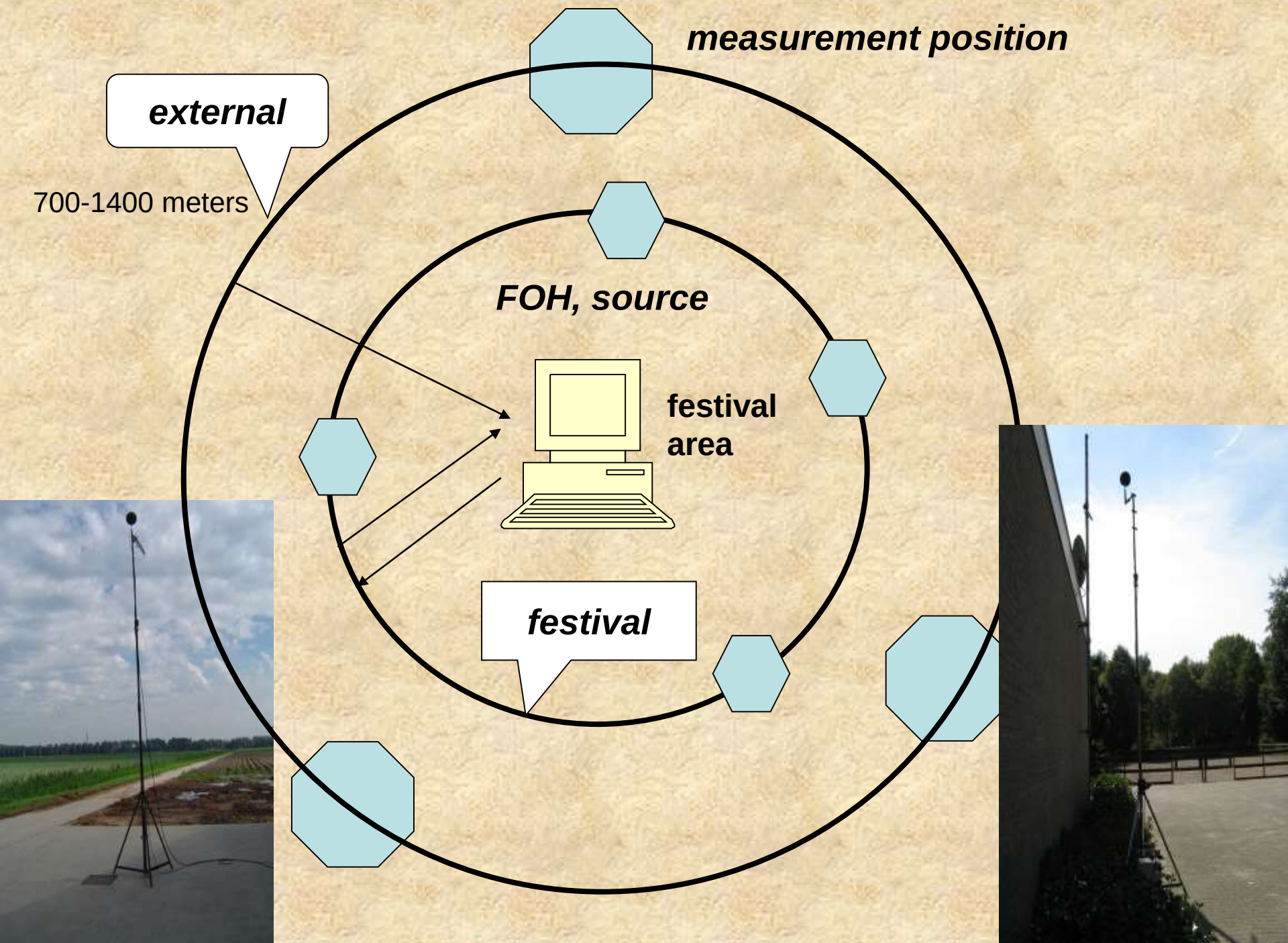
external

700-1400 meters

Central PC
backstage

measurement position

measurement position


measurement position
external
700-1400 meters
FOH, source
festival area
festival

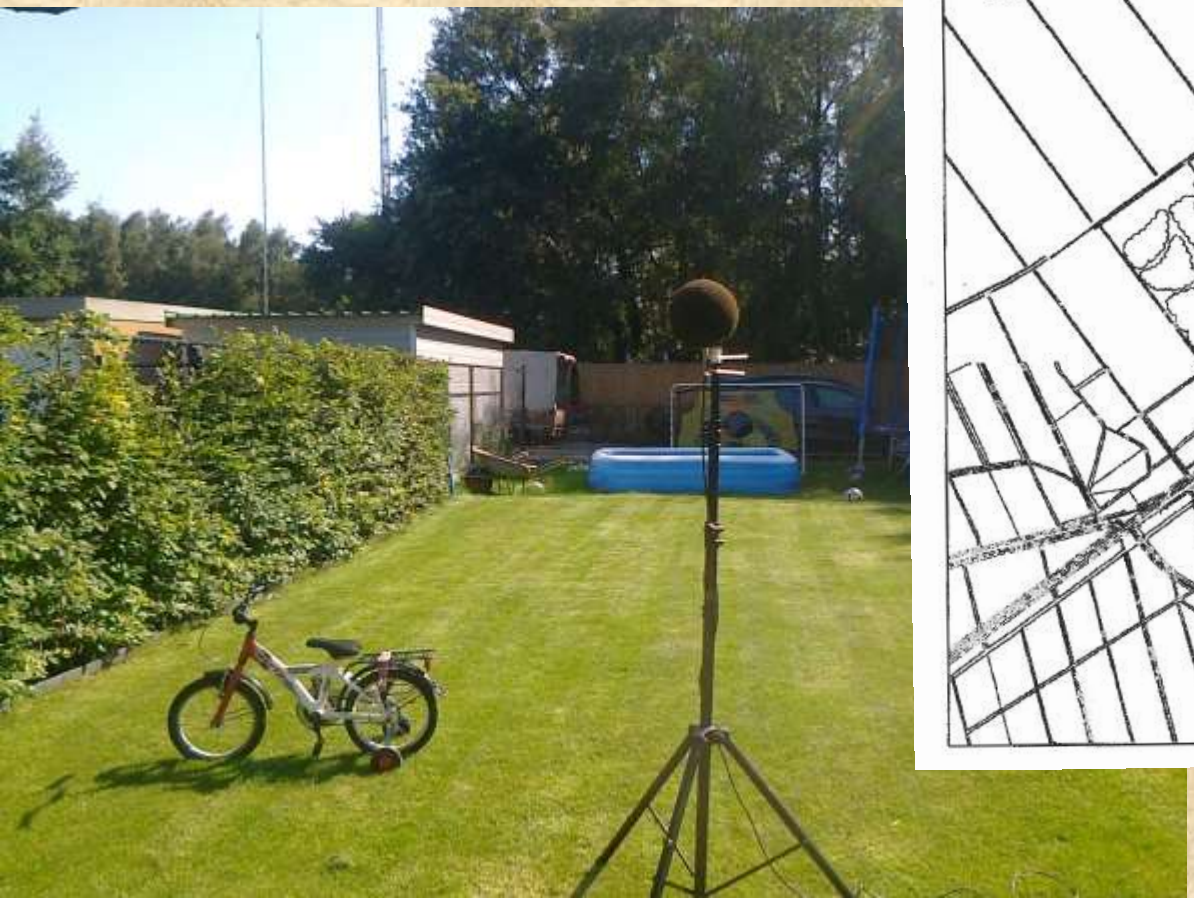
dBcontrol method:

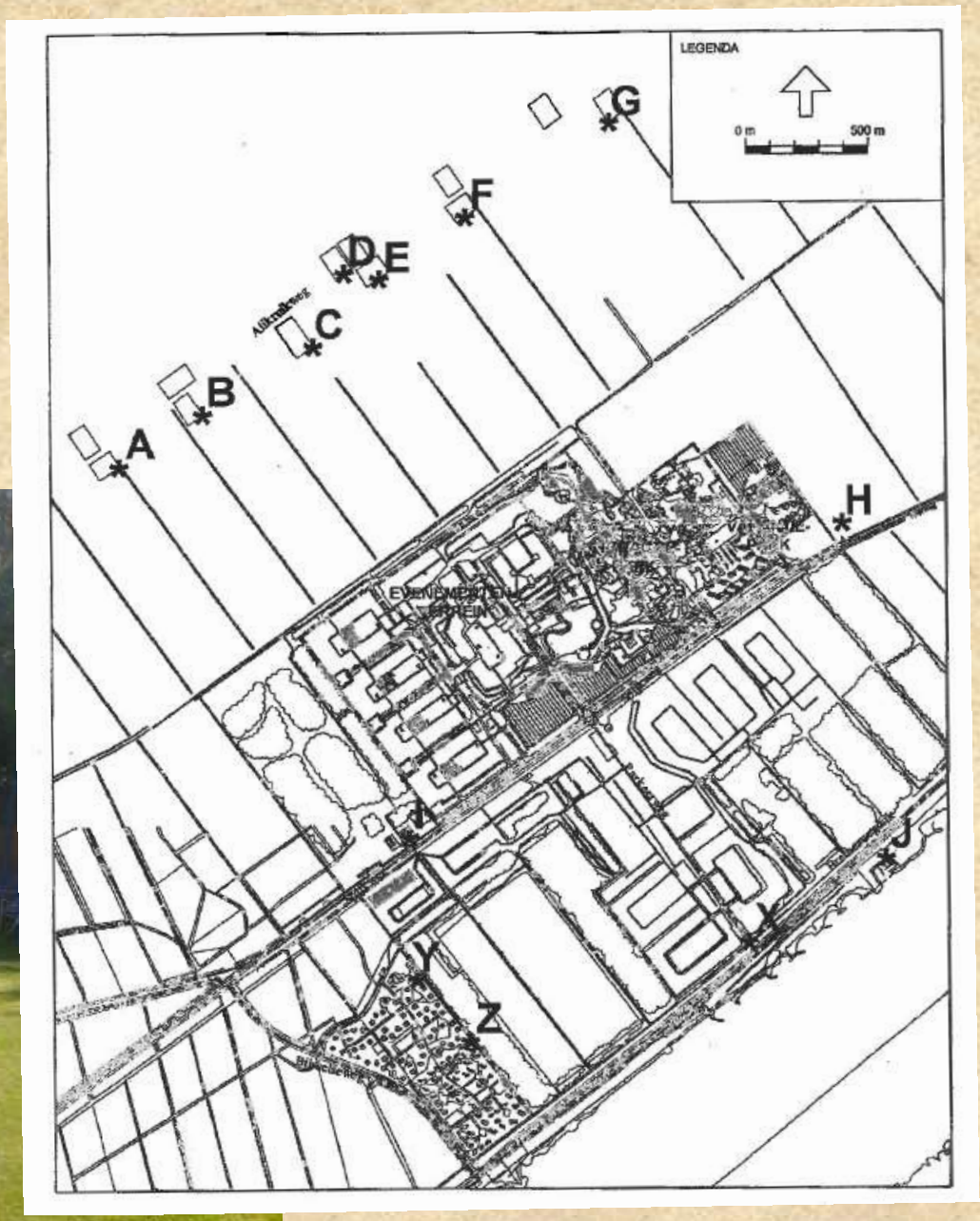
1.measurements in the surroundings
2.measurements at the source (FOH)
3.realtime display on central computer
4.instructions to the sound engineers

Tricky:

-in license many points?
(all houses!)

- then measure all points.....





Wednesday:

1. introduction
2. world of dBcontrol
3. history of sound level management
4. calculation of sound
5. sound measurement plan
6. **materials**

Maatregelen meenemen in berekeni

ECHO BARRIER®
Environmentally Sound
INNOVATIVE ACOUSTIC PRODUCTS
HIGH PERFORMANCE MATERIALS
EFFECTIVE & ECONOMICAL

AlHfence®

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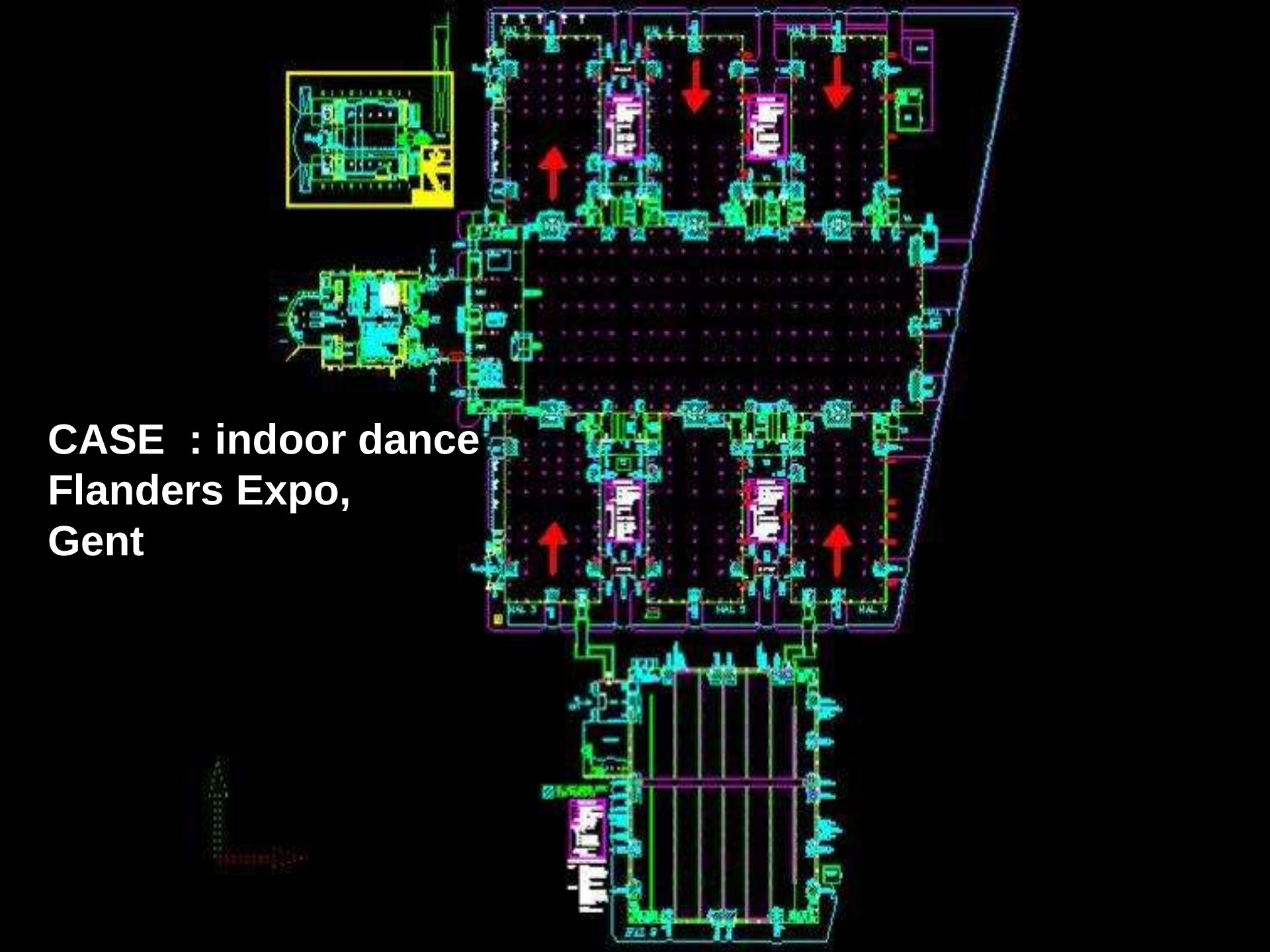
7. **case: I love Techno, Gent, Belgium**



CASE : indoor dance
Flanders Expo,
Gent

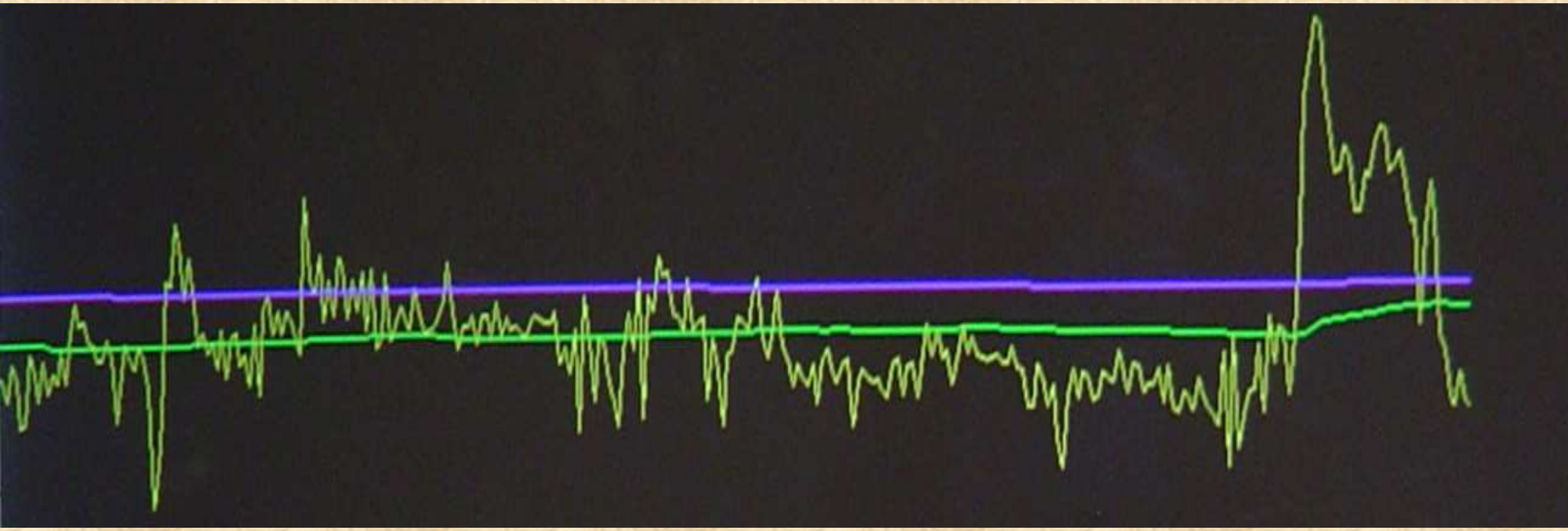
EXPO, Ghent, Belgium

- microphone in the center of the hall
- 6 halls

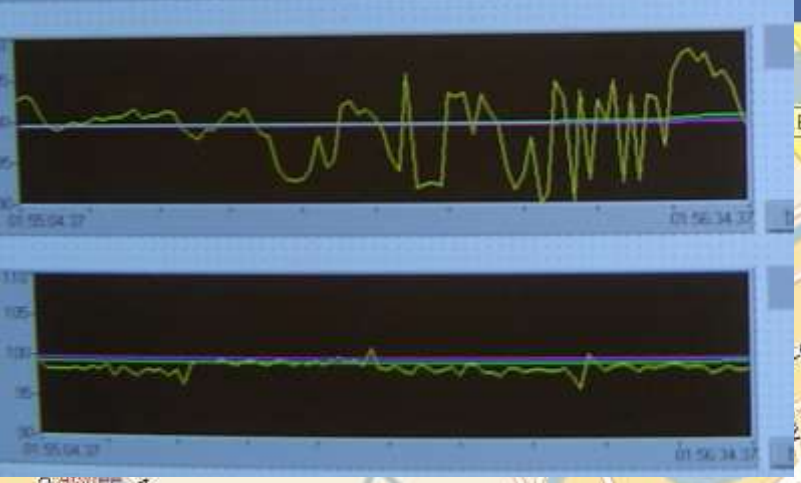
Hal 1
1
101.3
99.5
99.5
Hal 2
2
96.7
96.7
96.7
Hal 4
4
95.1
98.1
98.1
22:36:08
Hal 5
5
96.7
99.9
99.9
Hal 6
6
97.5
101.2
101.2
Hal 7
7
100.7
100.6
99.3

prediction of sound levels: trendindicator

LAeq @ 30 minutes is leading
extra trendindicator over 3 or 5 minutes



62,7
62,9
60,8
58,3
62,7
59,6
61,8
58,4
62,0



quick response on complaints
history in datafile/graph

Case dance indoor, Ghent Belgium

Good cooperation with local police and environmental health officers

Result : significant lowering of sound radiation to the neighbourhood
Result: no fine since 2002

C100

www.dBcontrol.nl

Politiezone Gent

STAD GENT

Wednesday:

1. introduction
2. world of dBcontrol
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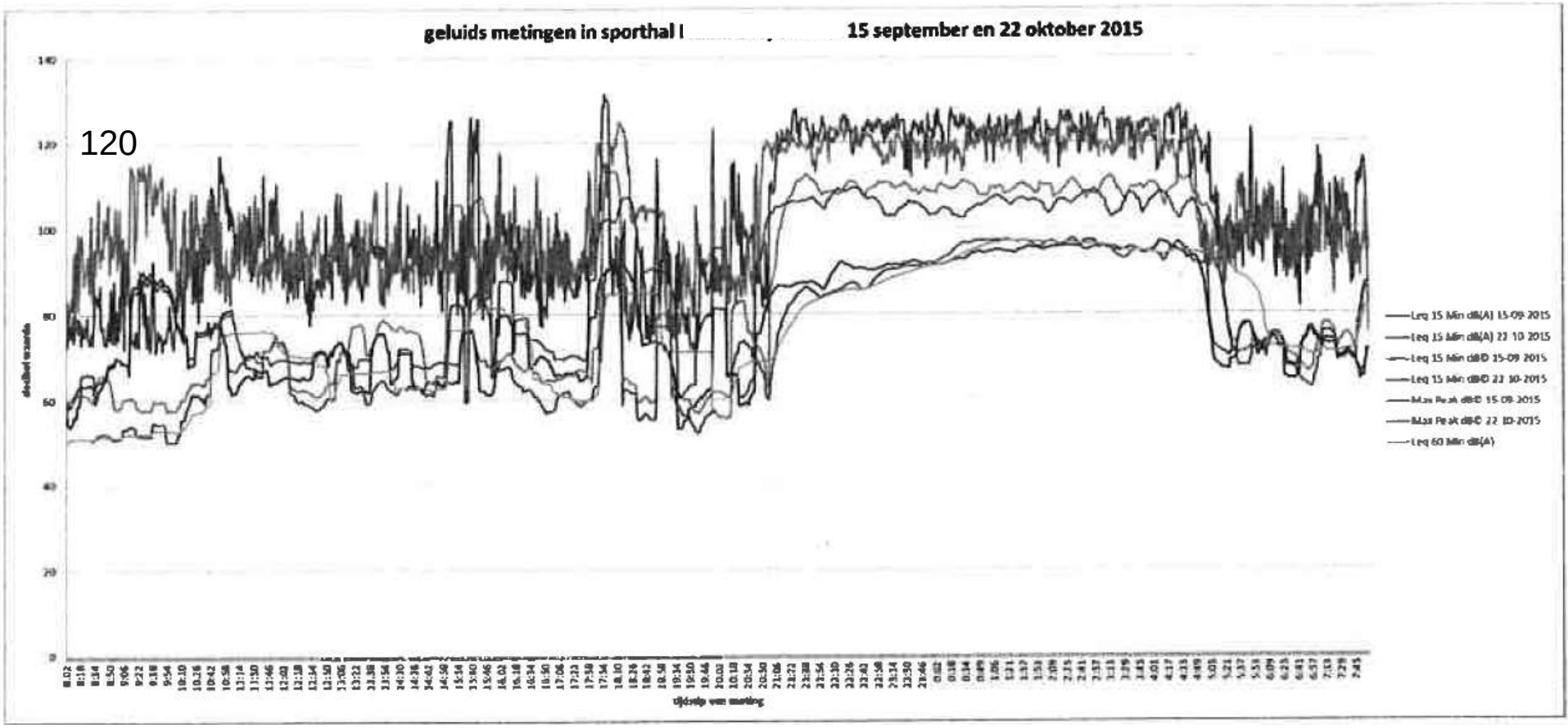
4. calculation of sound
5. sound measurement plan
6. materials
7. case: I love Techno, Gent, Belgium
8. **various troubles / 5 cases**

Troubles, case: Lcpeak

plan for a new (sports) hall with music events

Troubles, case: Lcpeak



too much information!

protest from neighbours against the plans, issue: Lcpeak

Lc peak:

DIRECTIVE 2003/10/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 6 February 2003

on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise)

(Seventeenth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC)

Article 2

Definitions

For the purposes of this Directive, the physical parameters used as risk predictors are defined as follows:

(a) peak sound pressure (p_{peak}): maximum value of the 'C'-frequency weighted instantaneous noise pressure;

Lc peak:

Article 3

Exposure limit values and exposure action values

1. For the purposes of this Directive the exposure limit values and exposure action values in respect of the daily noise exposure levels and peak sound pressure are fixed at:

(a) exposure limit values: $L_{EX,8h}$ = 87 dB(A) and p_{peak} = 200 Pa ([1]) respectively;

(b) upper exposure action values: $L_{EX,8h}$ 85 dB(A) and p_{peak} = 140 Pa ([2]) respectively;

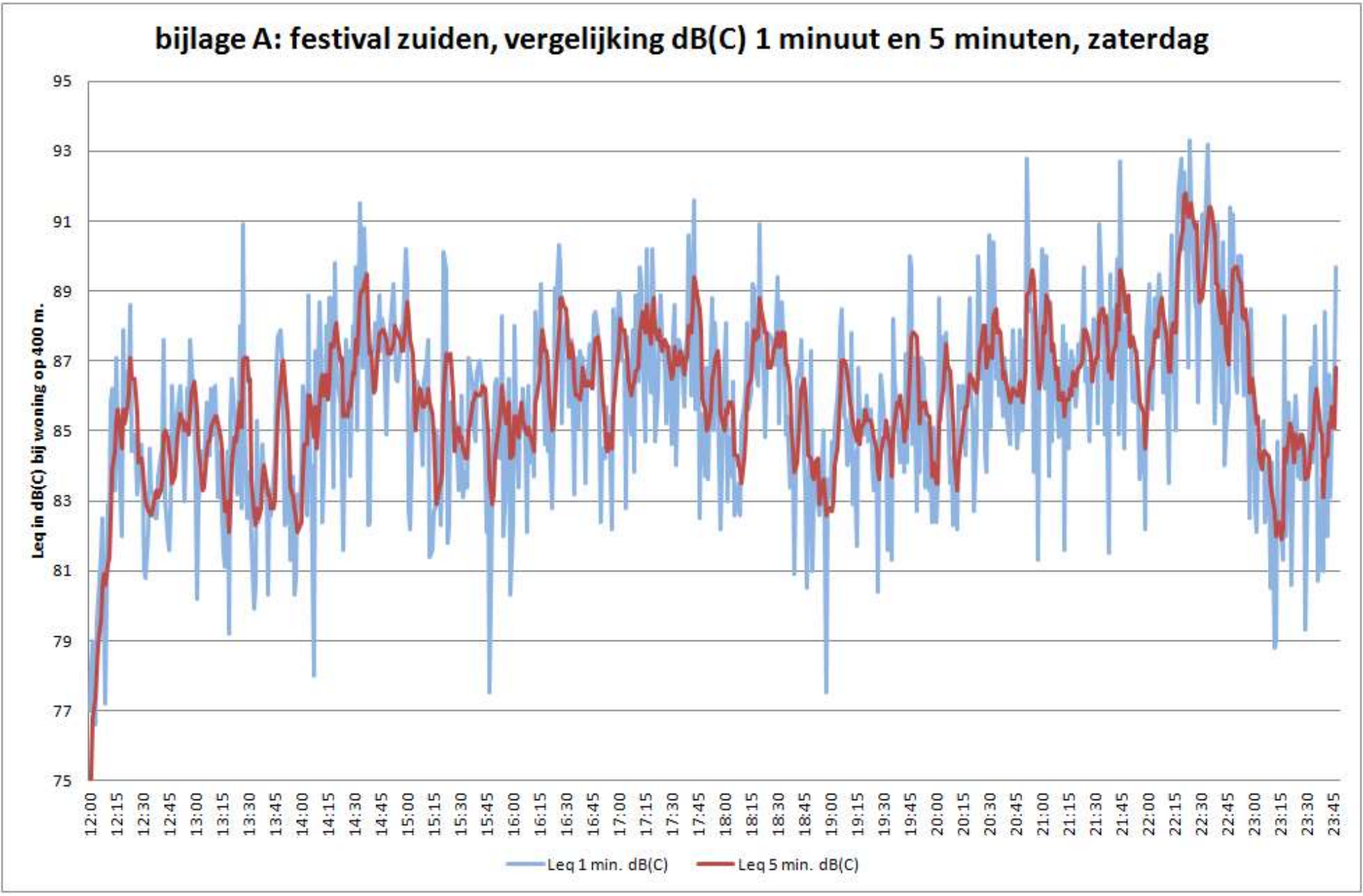
(c) lower exposure action values: $L_{EX,8h}$ = 80 dB(A) and p_{peak} = 112 Pa ([3]) respectively.

([1]) 140 dB (C) in relation to 20 µPa.
([2]) 137 dB (C) in relation to 20 µPa.
([3]) 135 dB (C) in relation to 20 µPa.

Troubles, case: Leq 1 minute dB(C)

History:
2014: Leq 5 min. = 95 dB(C) neighbours (400..800 m)
2015: Leq 5 min. = 90 dB(C) neighbours (400..800 m)
2016: Leq 1 min. = 90 dB(A) neighbours (400..800 m)

discussion about Cmeteo (-4.5 dB!!!!), ISO 1996-2



the difference [Leq 1 min. – Leq 5 min.] can go to 4 dB

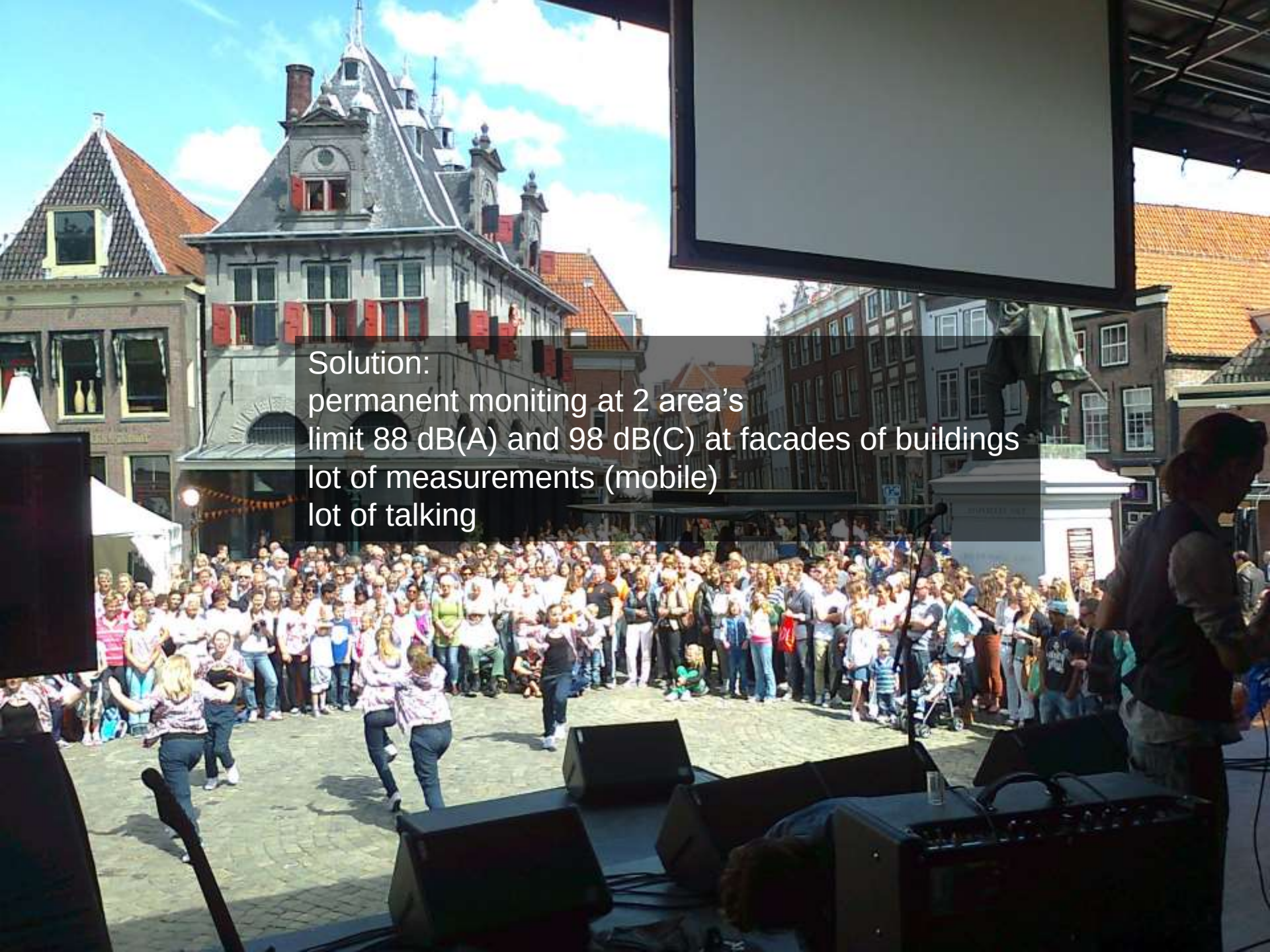
Troubles, case: Leq 1 minute dB(C)

proposal:

-agree on multiple exceedings of Leq 1 min.
-take more time to solve the problem during festival
-take into account Cmeteo

Troubles, case: city festival in Hoorn, NL

problems: to loud, wrong music balance wrong, no control


Solution:
permanent moniting at 2 area’s
limit 88 dB(A) and 98 dB(C) at facades of buildings
lot of measurements (mobile)
lot of talking

KONINGINNEDAG
UTRECHT

Case: Utrecht

26 april (market)
27 april (Kingsday)

challenge:
14 stages with music
> 100.000 people

limit: 93 dB(A) & 108 dB(C

what's the role of the local authority?

solution:
- mobile measurements at 14 area's,
- lot of talking,
- consultancy

case: hardcore festival 22hr-07 hr
problem: 23 measurement points outside

solution: stick to the plan with 2 permanent monitoring stations outside

Wednesday:

1. introduction
2. world of dBcontrol
3. history of sound level management
4. calculation of sound
5. sound measurement plan
6. materials
7. case: I love Techno, Gent, Belgium
8. various troubles / 5 cases
9. **a movie from Norway**

http://www.nrk.no/telemark/stoykrav-wrightegaarden-1.12003342

Forecast

- more lawyers work
- more attentions for the ears of the audience
- more attention for comfort/quality audio

measurements:

- more data
- all data to a server with intelligent software and loads of parameters

PDF sheets available :
www.dBcontrol.nl/Trondheim

Questions?