

# An Improved Loudspeaker Frequency Response by the Use of Rigid Absorptive Panels in Vented Cabinets.

Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

## Original Design Constraints:

- 1) Cabinet Size
- 2) Cabinet Shape
- 3) Tuning Frequency

Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

## Cabinet Size

The Cabinet had aspect constraints due to industrial design and the size of the loudspeaker drivers, in the specific a 12" Woofer and a horn of mouth of similar size

Balistreri Riccardo

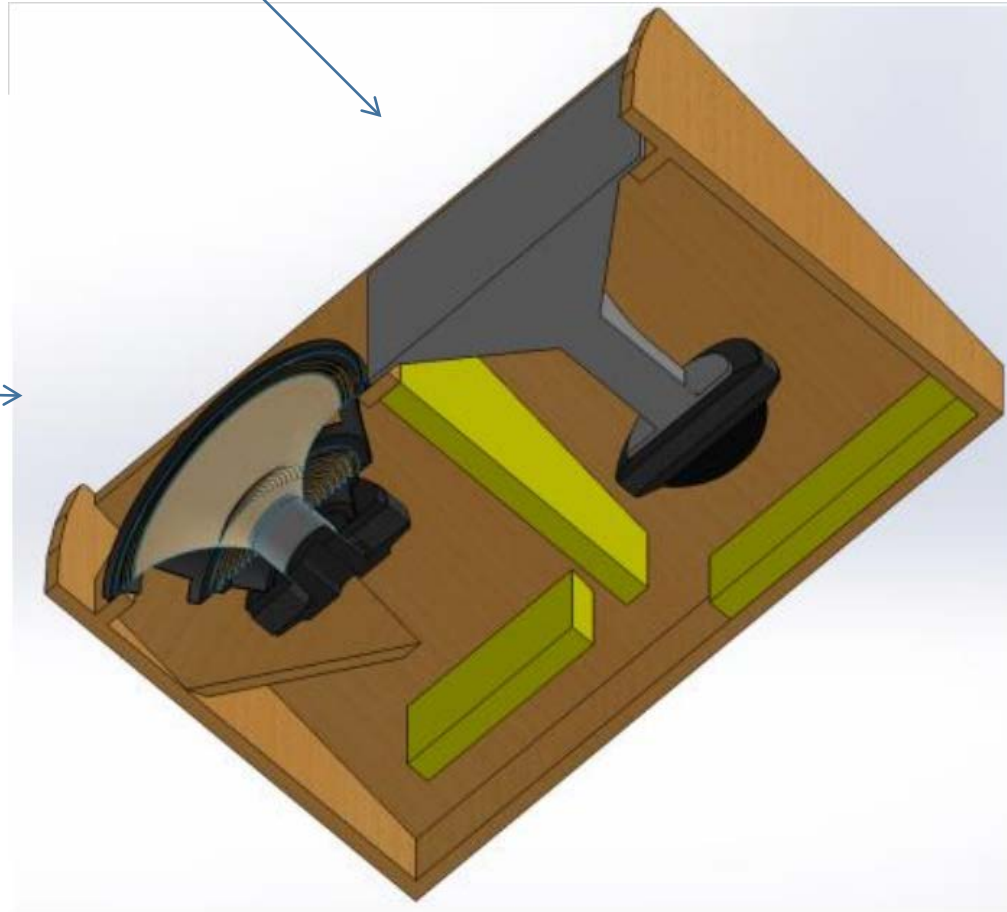
Loudspeaker Design Engineer

Community Professional Loudspeakers



Horn

12" Woofer



Danseren Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers



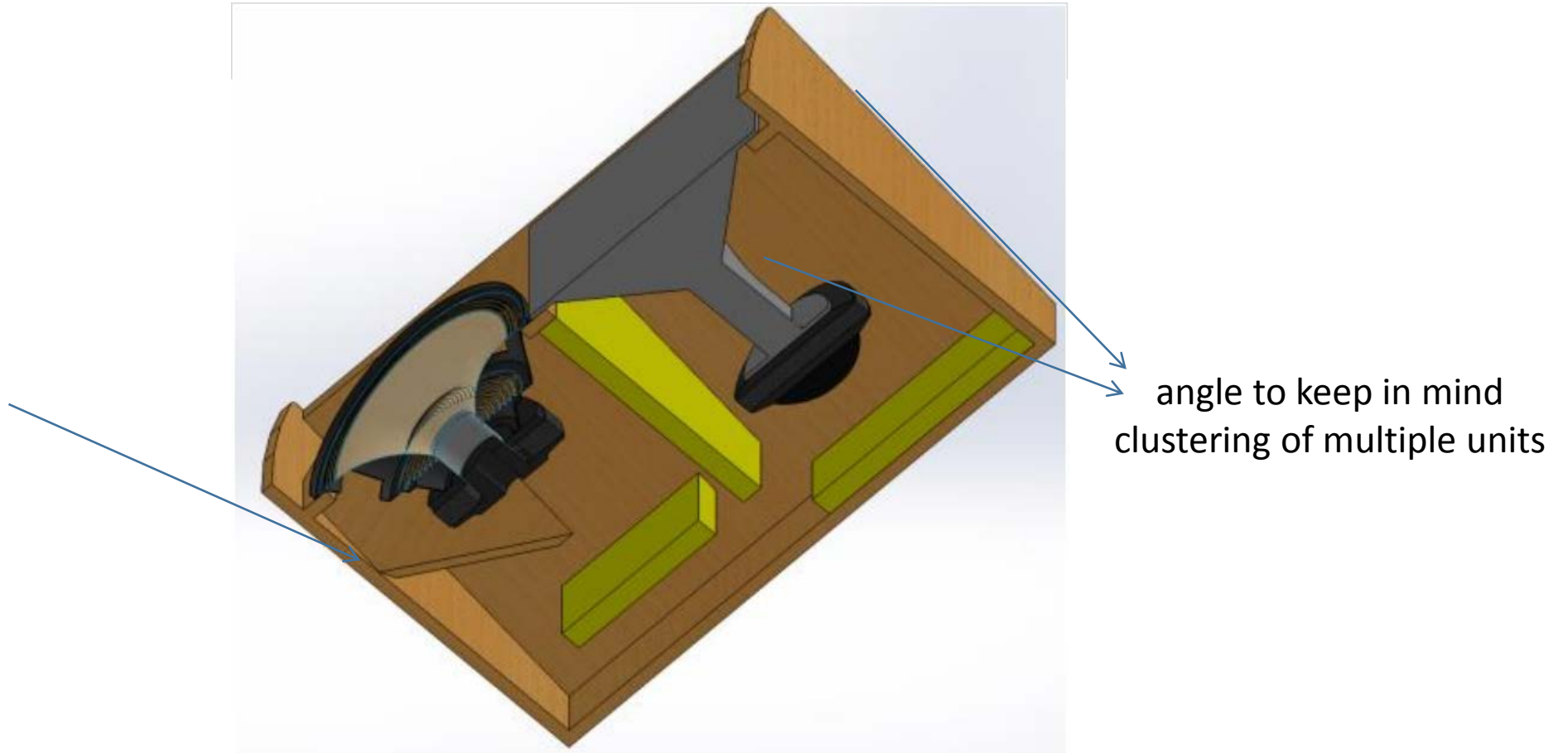
## Cabinet Shape

The loudspeaker was designed for the purpose of fixed installation on venues, quite often such cabinets they have to be shaped so that they mount as cluster of several units to increase coverage

Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers



Speaker Design Engineer

Loudspeaker Design Engineer

Community Professional Loudspeakers

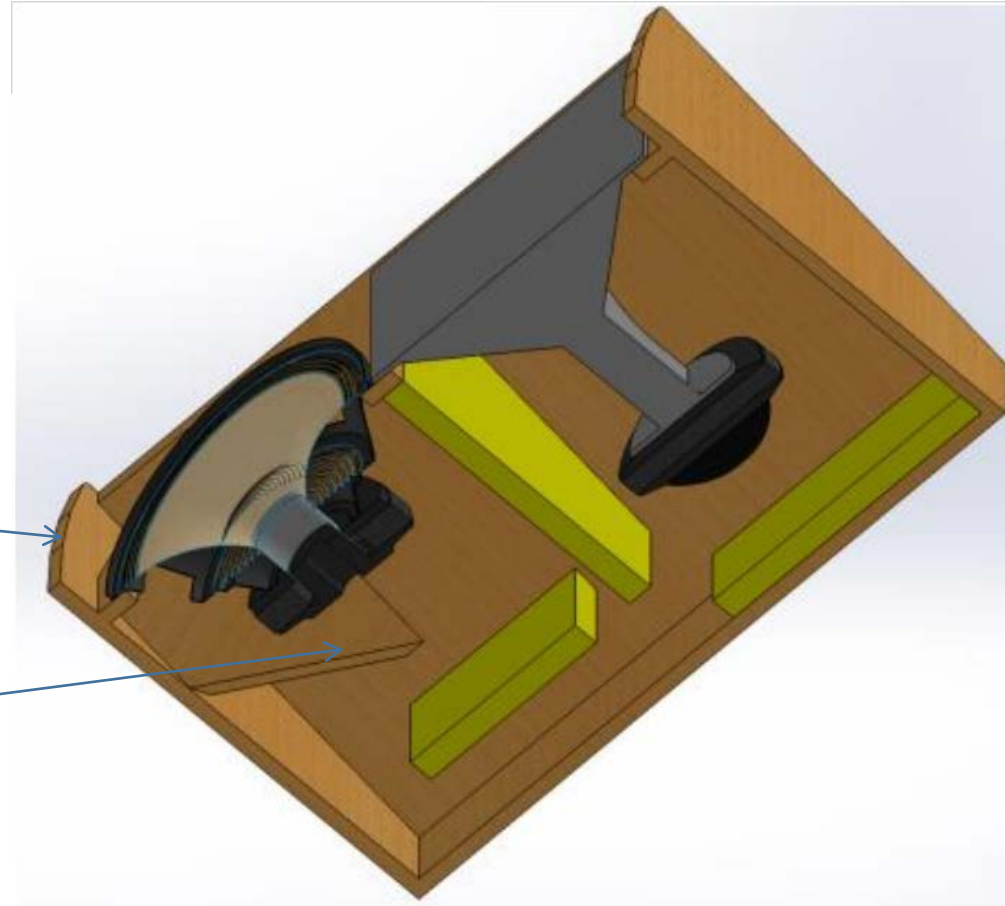
## Tuning Frequency

It had been requested by the Director of Product Development to have an extension of the low frequency response such that it would be useful down to 40Hz

Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers



Angle of the cabinet forced ports to be limited on the bottom physical extension.

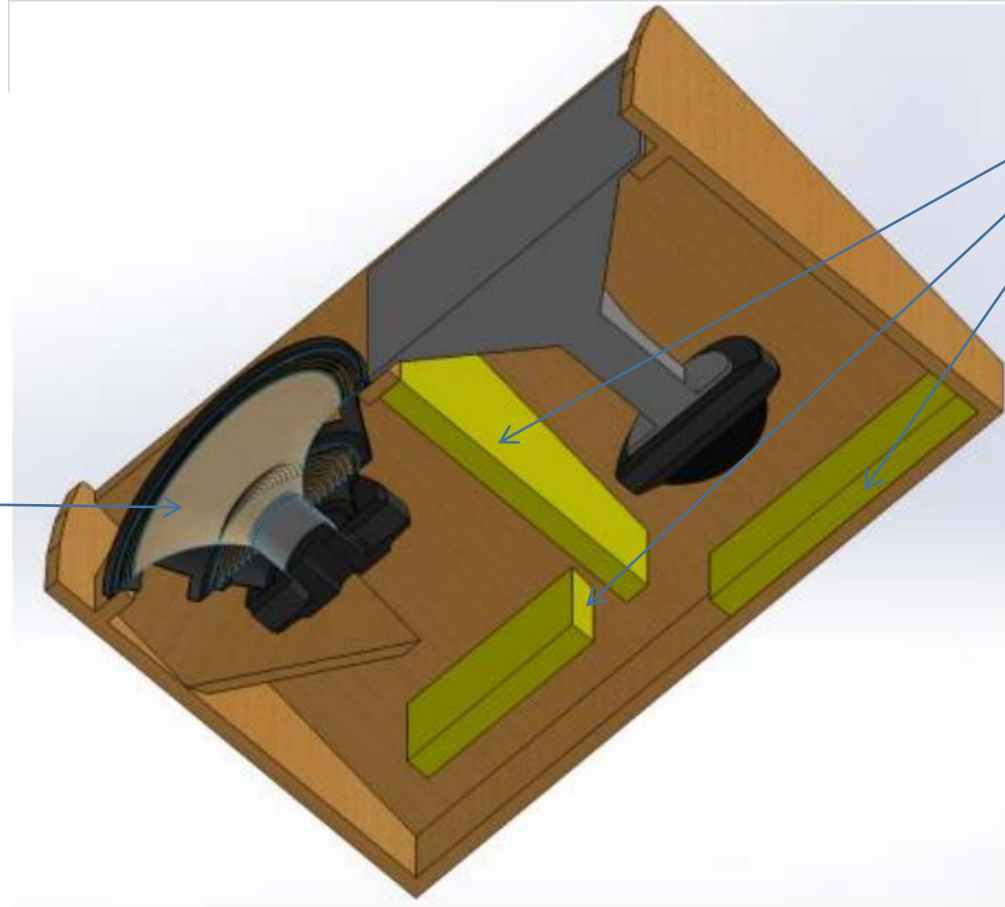
COMSOL was useful to determine longer side length

Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

The Vented Loudspeaker Enclosure model was taken as a template for this simulation



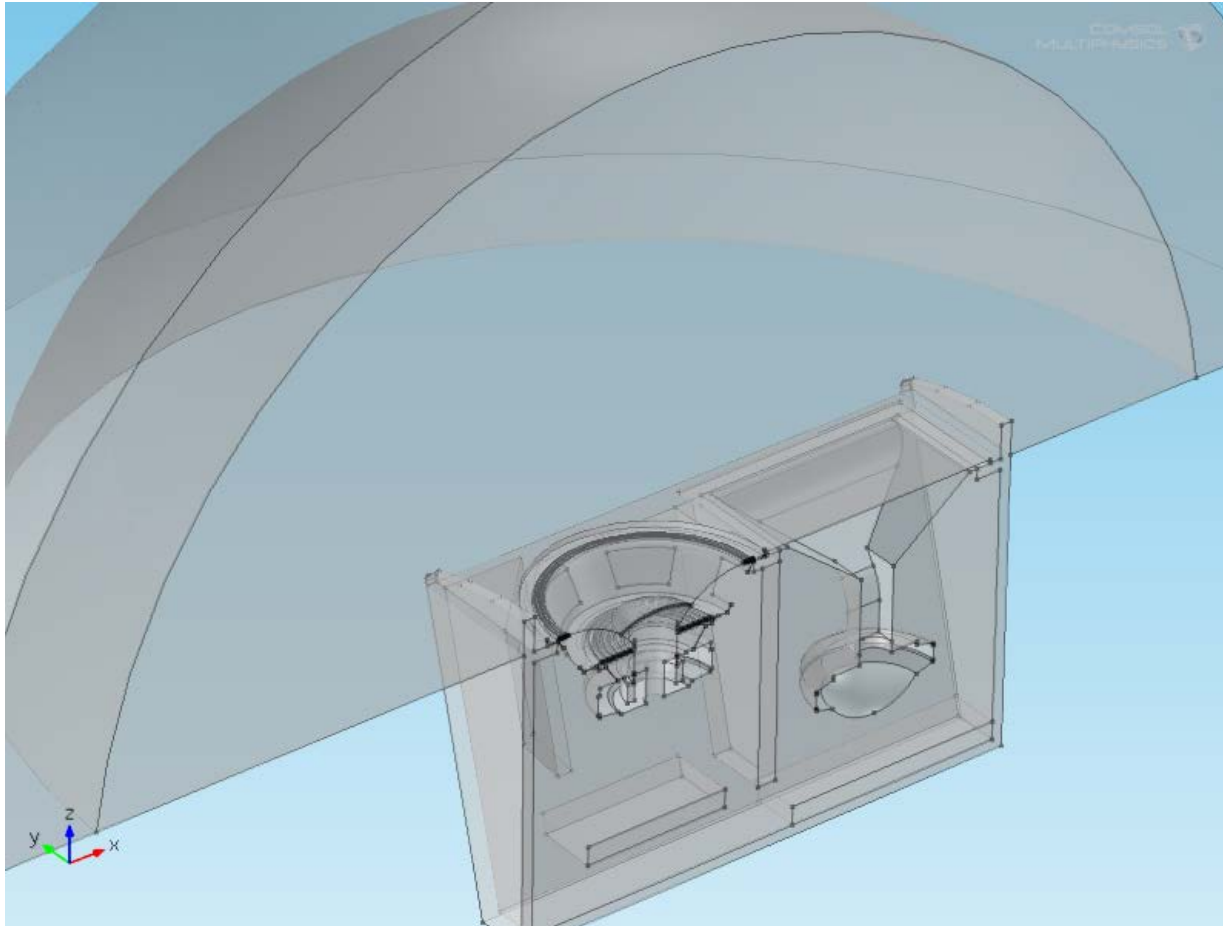
The Absorptive Muffler model was adopted as another physics to add in order to simulate damping in pressure acoustics

Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

The Vented Loudspeaker Enclosure model was taken as a template for this simulation



The Absorptive Muffler model was adopted as another physics to add in order to simulate damping in pressure acoustics

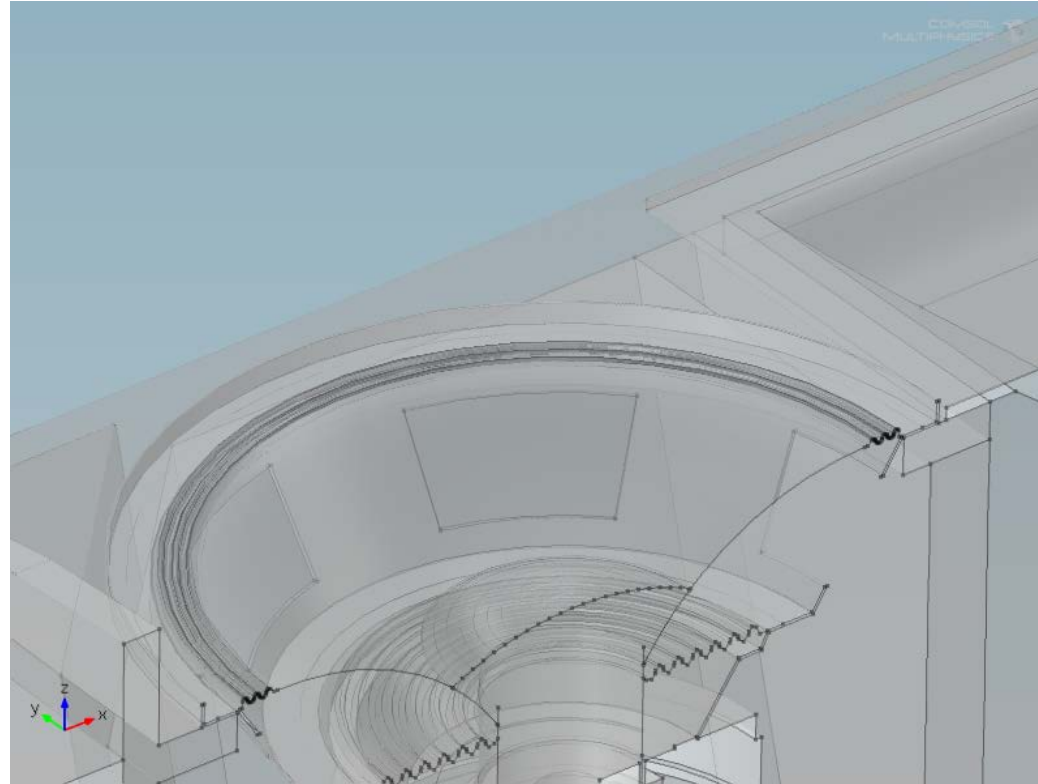
Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers



The Vented Loudspeaker Enclosure model was taken as a template for this simulation



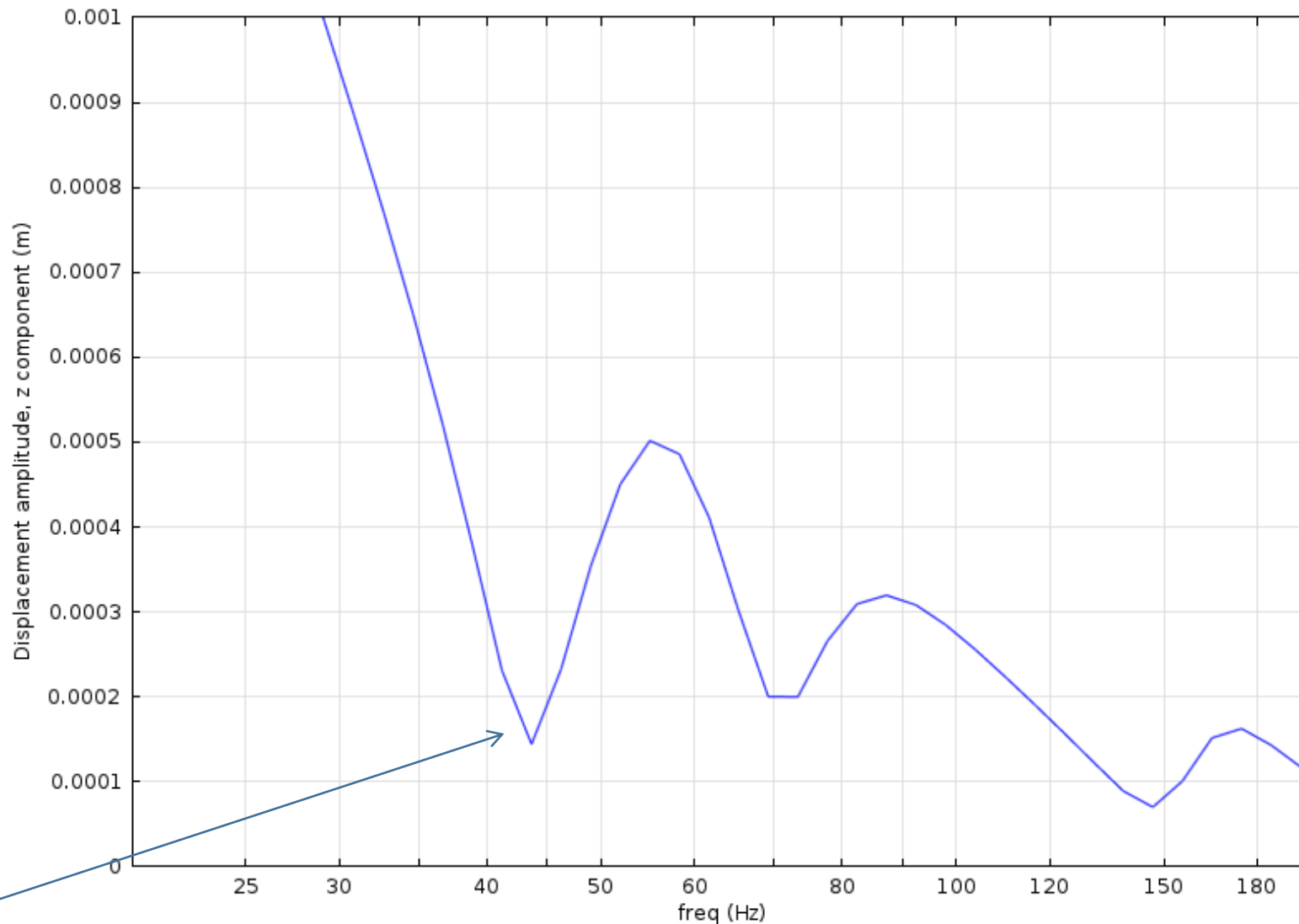
The Baffled Membrane model and Lumped Loudspeaker Driver is useful to understand and in the specific verify the model

Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

Point Graph: Displacement amplitude, z component (m)



Tuning frequency, when port activates the loudspeaker diaphragm has a minimum value of displacement

Balistreri Riccardo

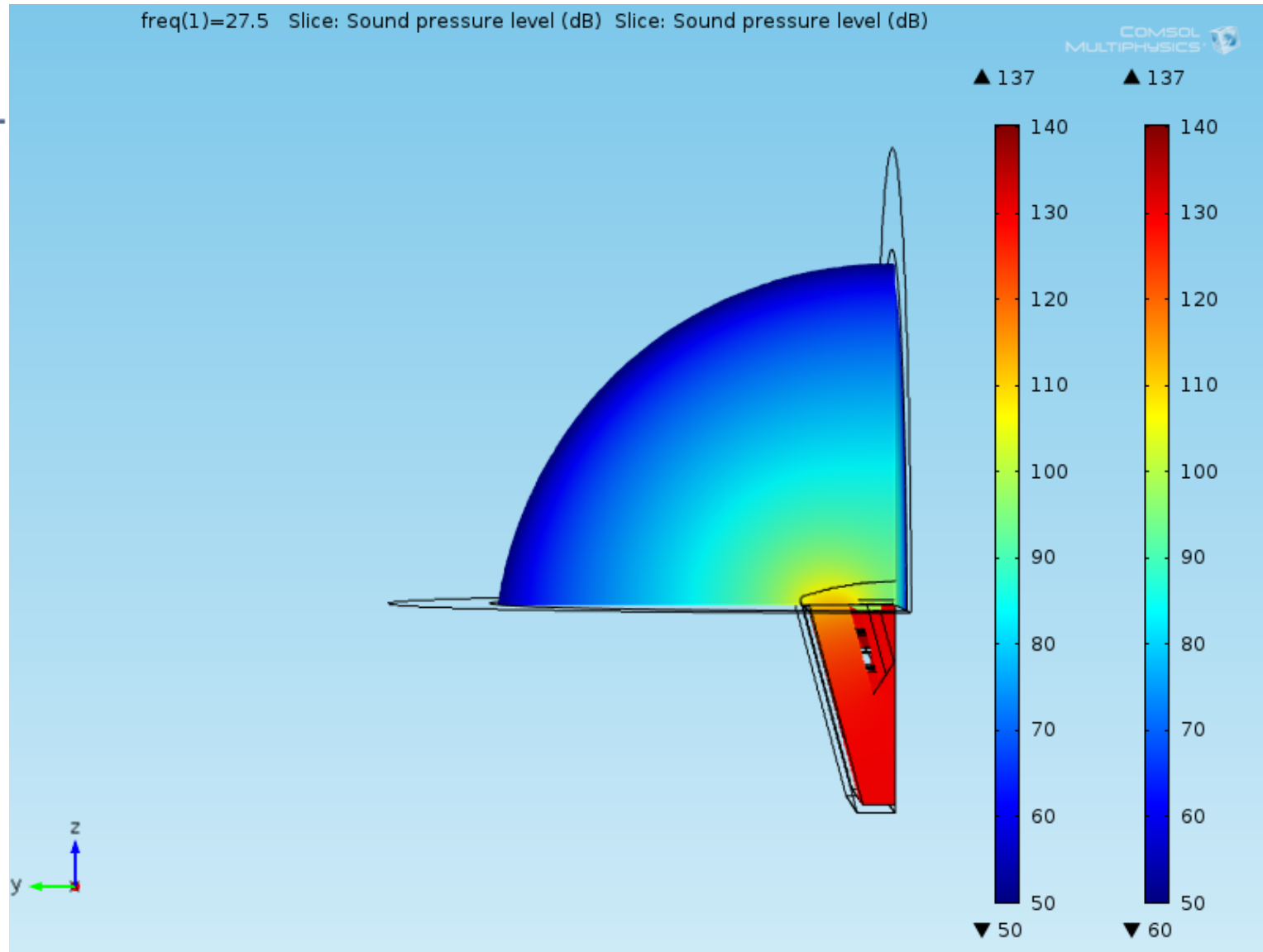
Loudspeaker Design Engineer

Community Professional Loudspeakers





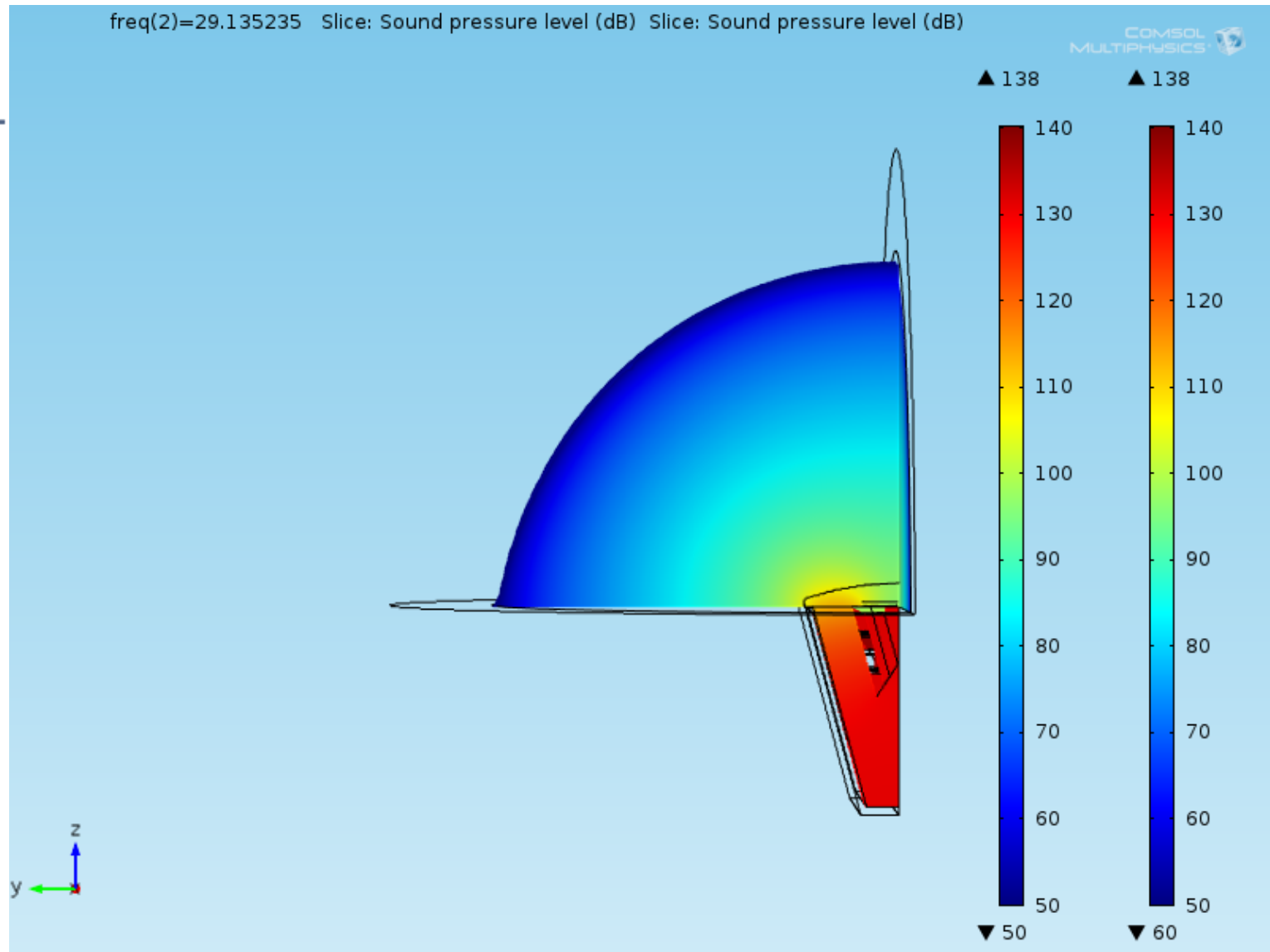
SPL at Port



Balistreri Riccardo

Loudspeaker Design Engineer

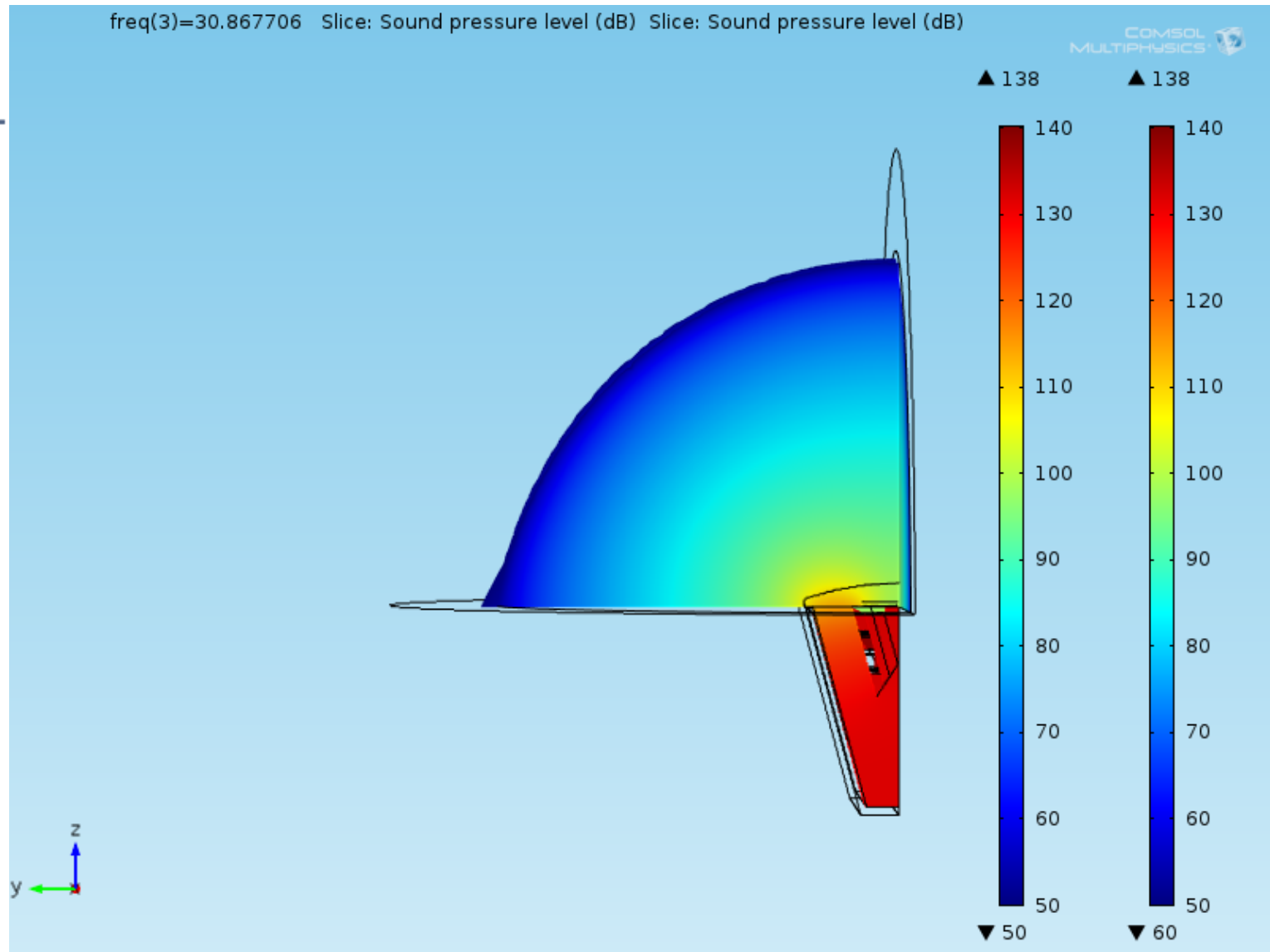
Community Professional Loudspeakers



Balistreri Riccardo

Loudspeaker Design Engineer

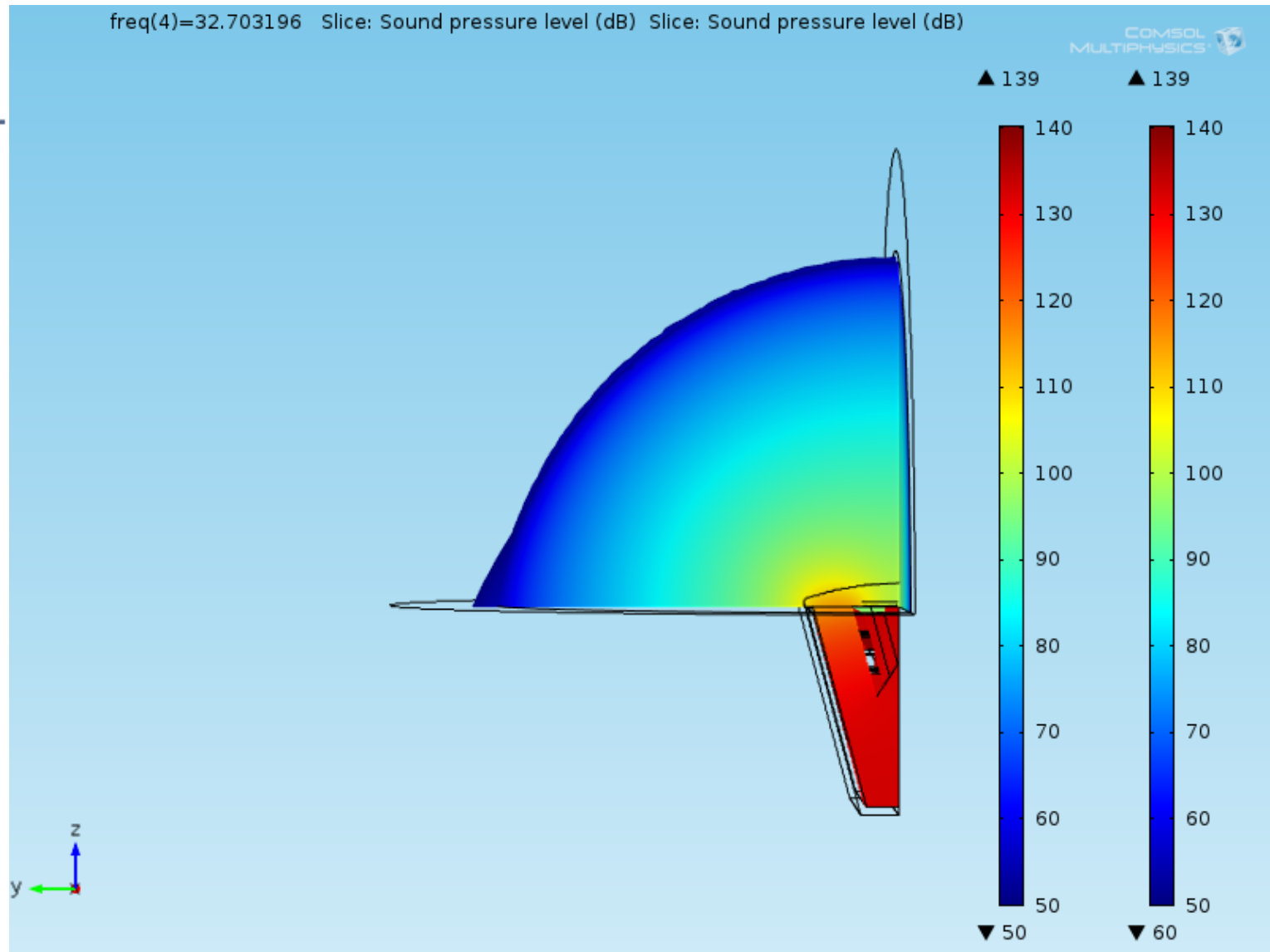
Community Professional Loudspeakers



Balistreri Riccardo

Loudspeaker Design Engineer

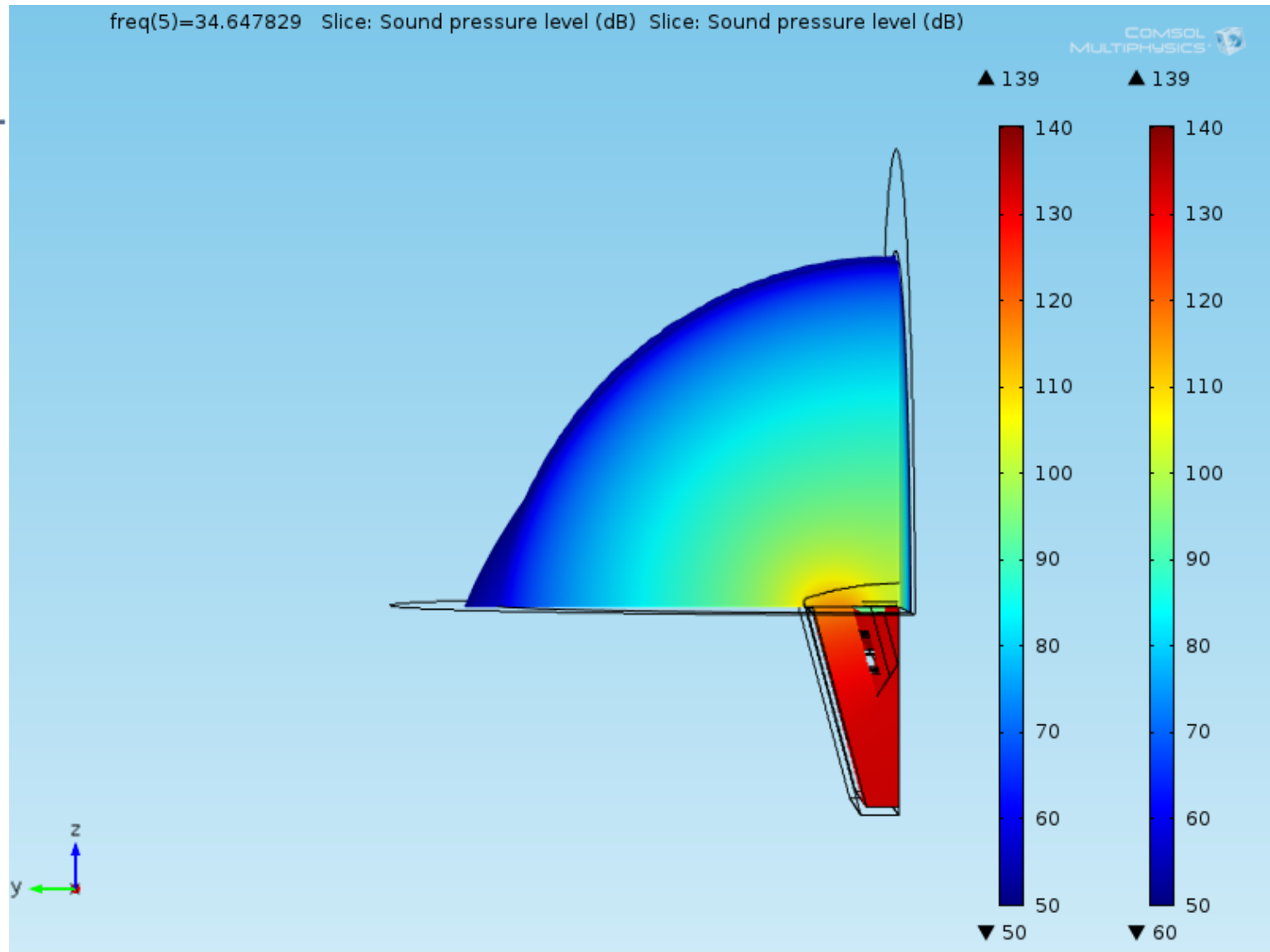
Community Professional Loudspeakers



Balistreri Riccardo

Loudspeaker Design Engineer

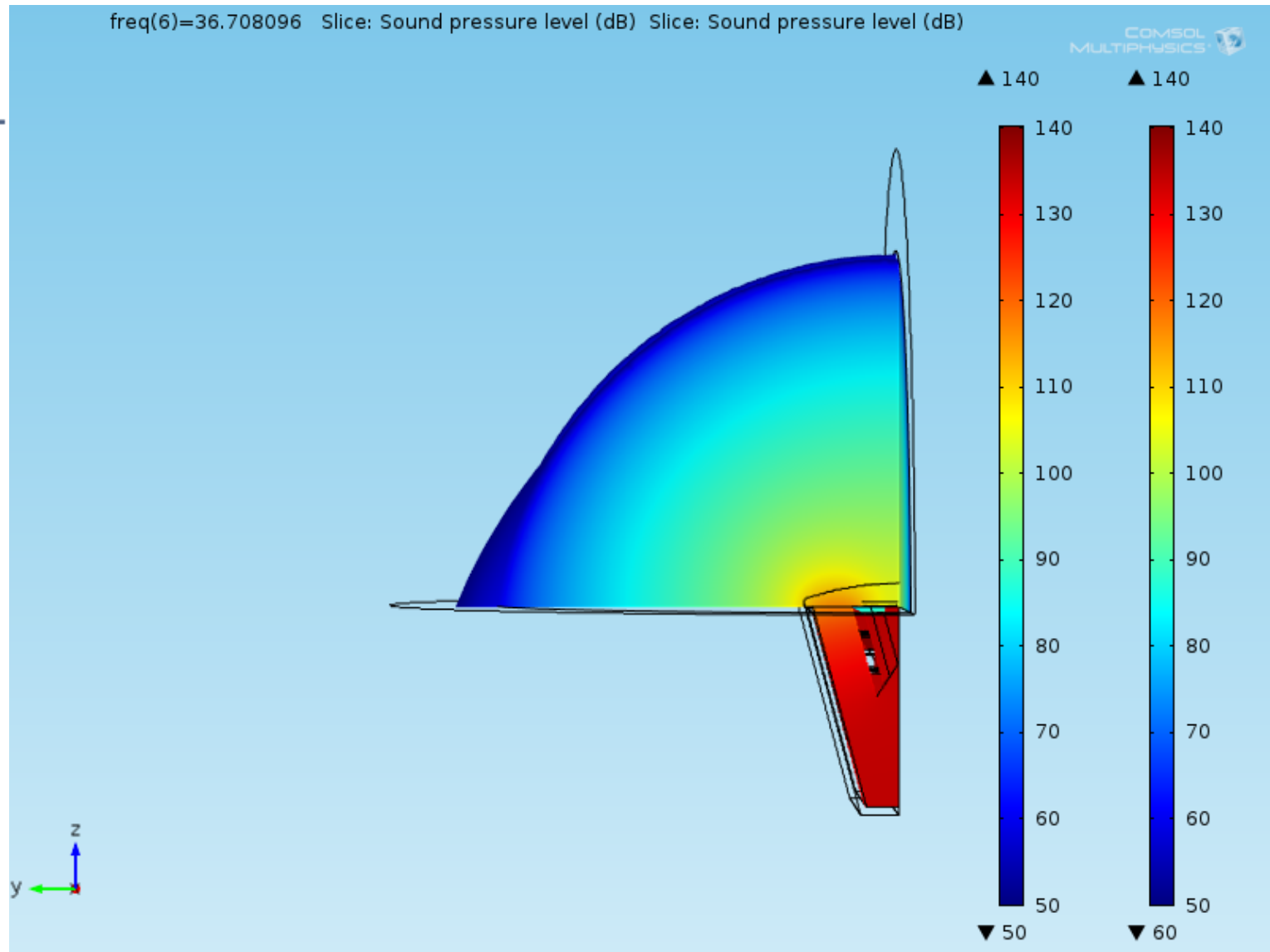
Community Professional Loudspeakers



Balistreri Riccardo

Loudspeaker Design Engineer

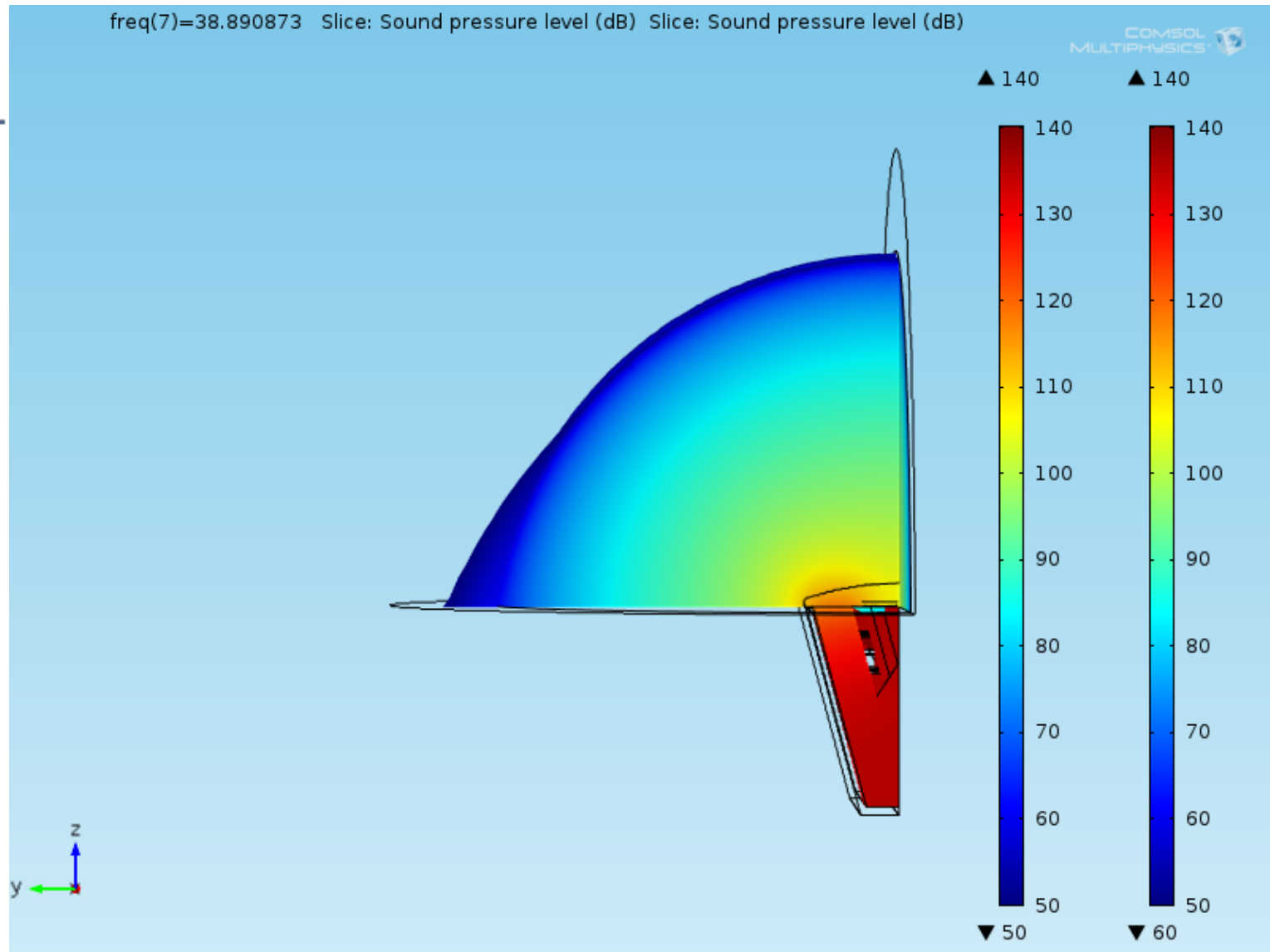
Community Professional Loudspeakers



Balistreri Riccardo

Loudspeaker Design Engineer

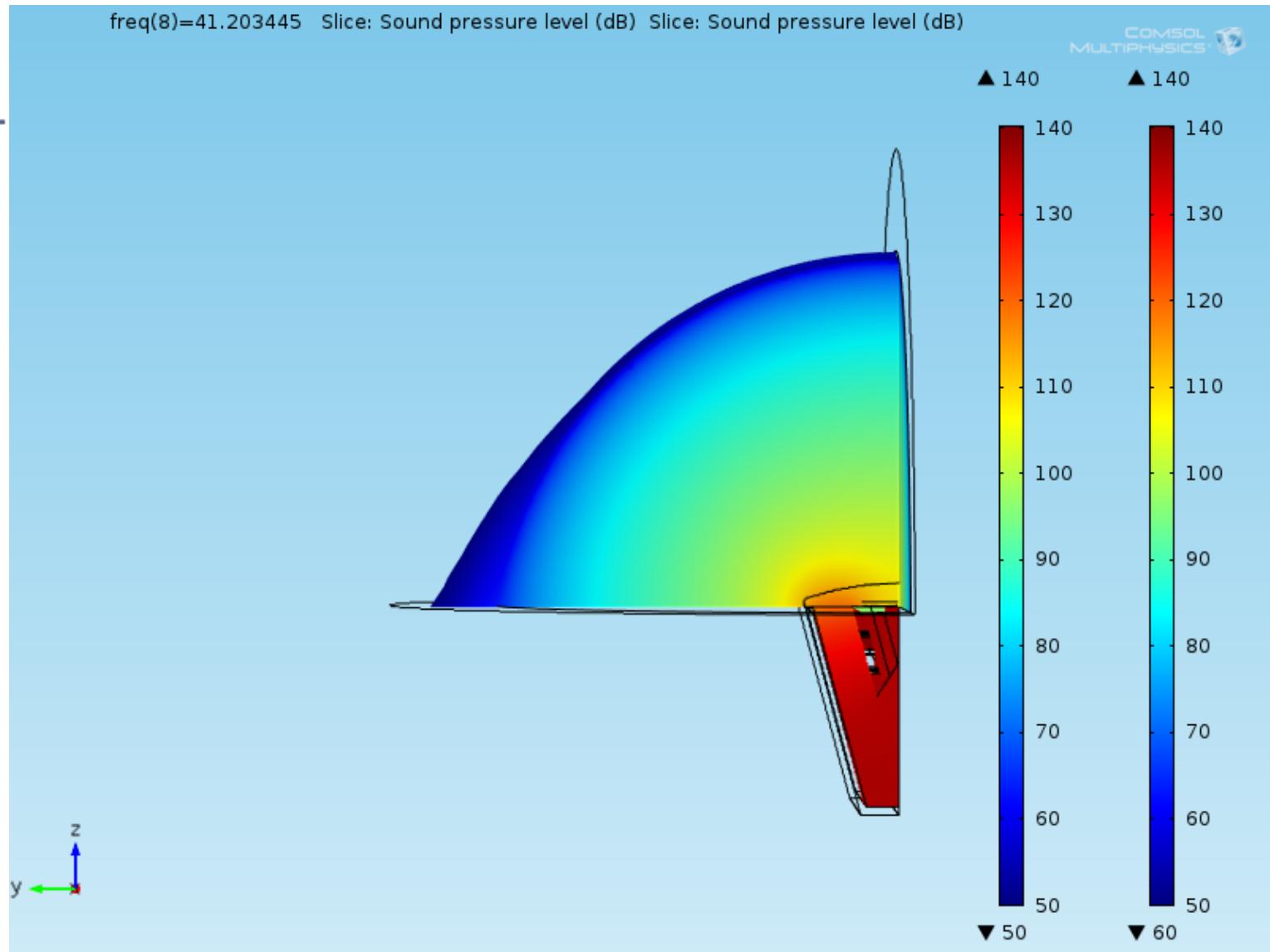
Community Professional Loudspeakers



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

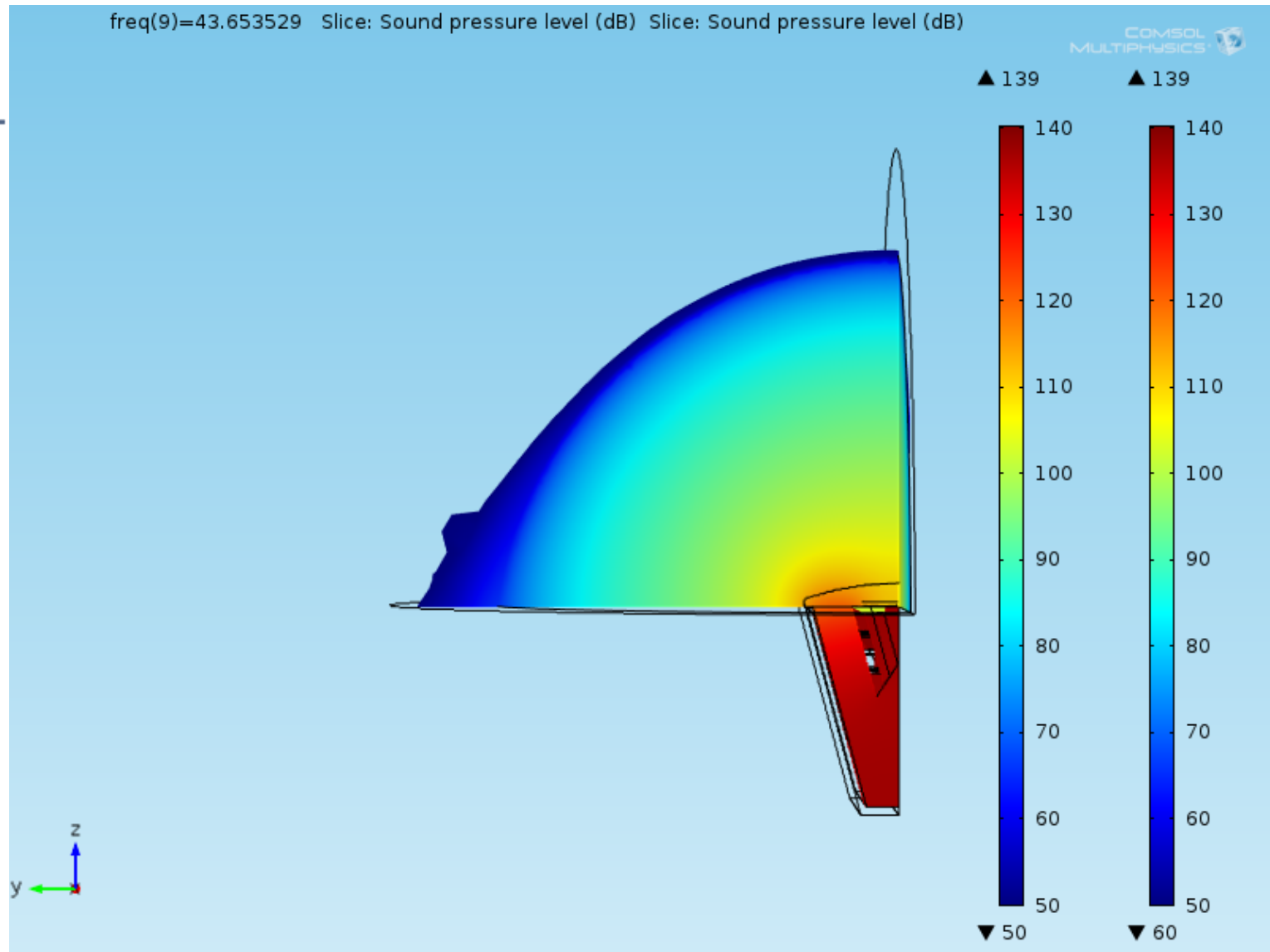


Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

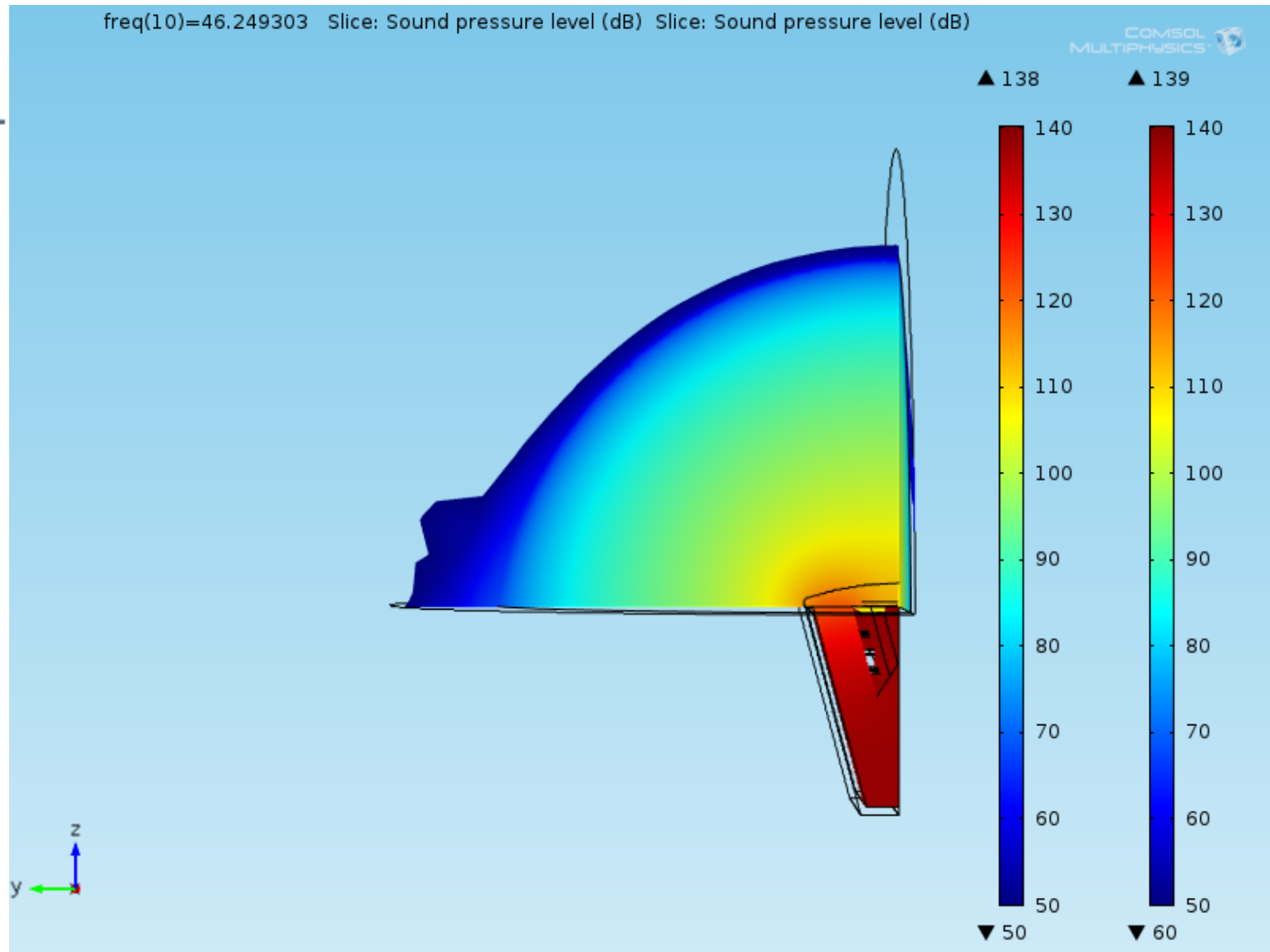




Balistreri Riccardo

Loudspeaker Design Engineer

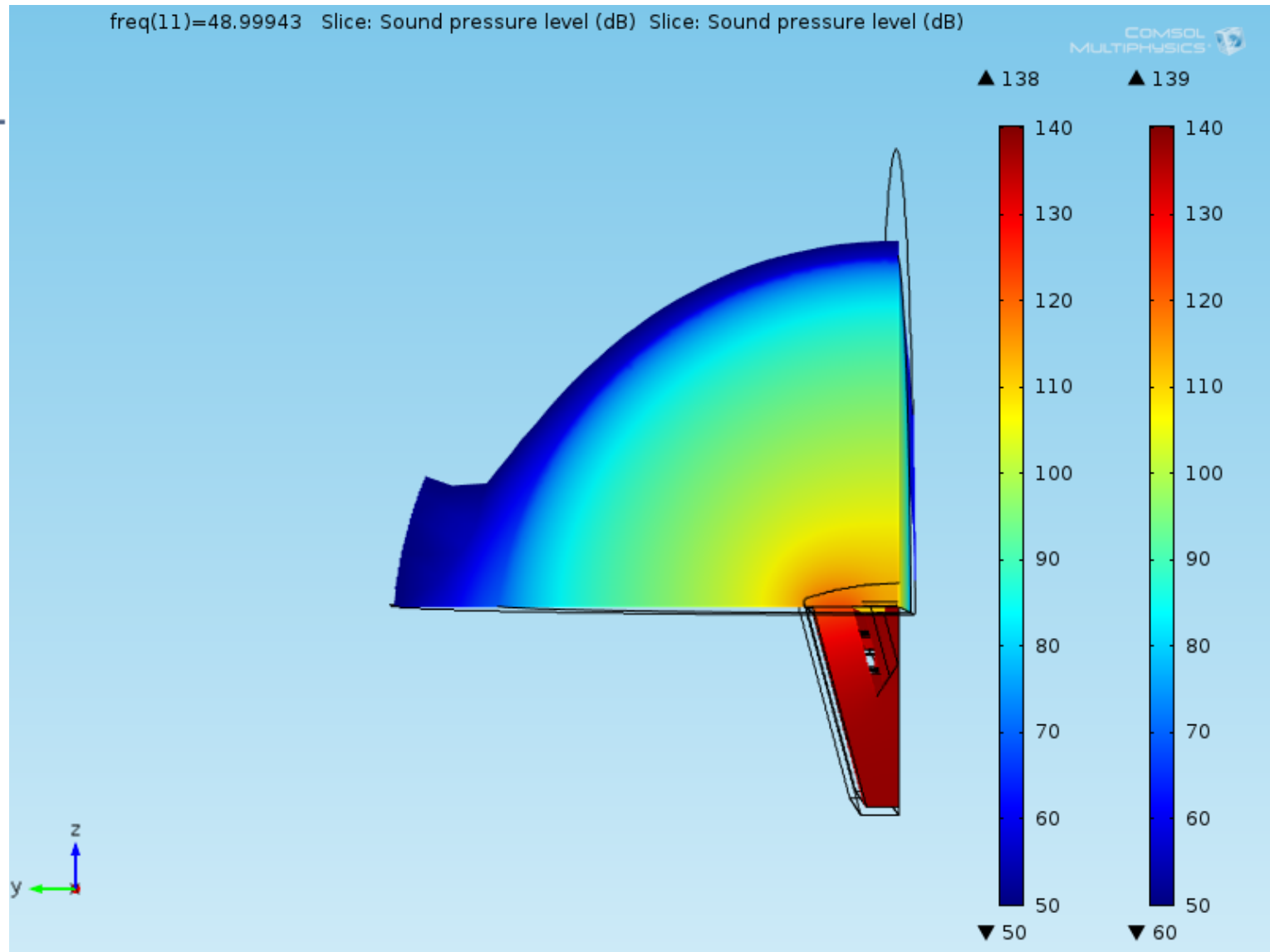
Community Professional Loudspeakers



Balistreri Riccardo

Loudspeaker Design Engineer

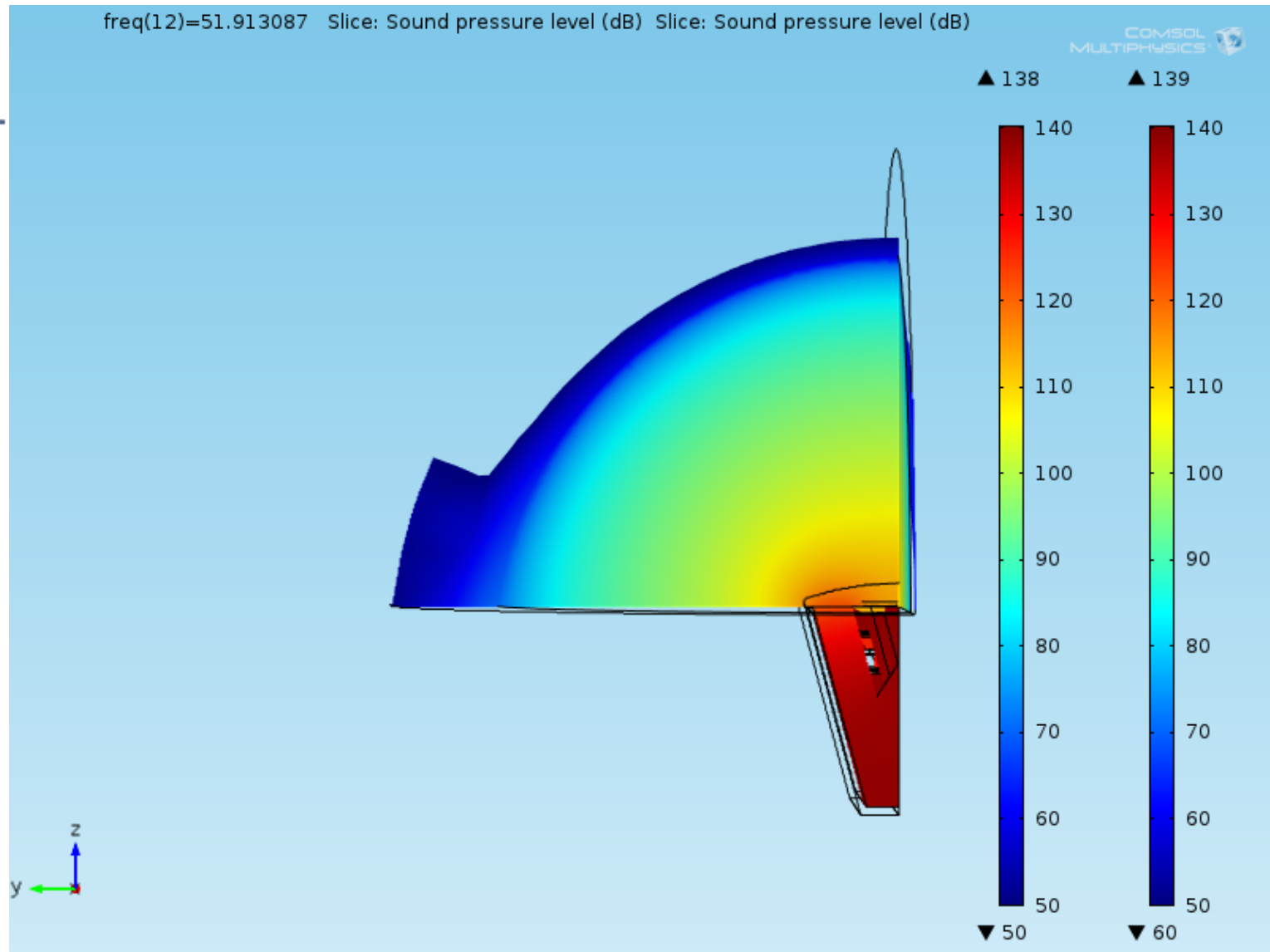
Community Professional Loudspeakers



Balistreri Riccardo

Loudspeaker Design Engineer

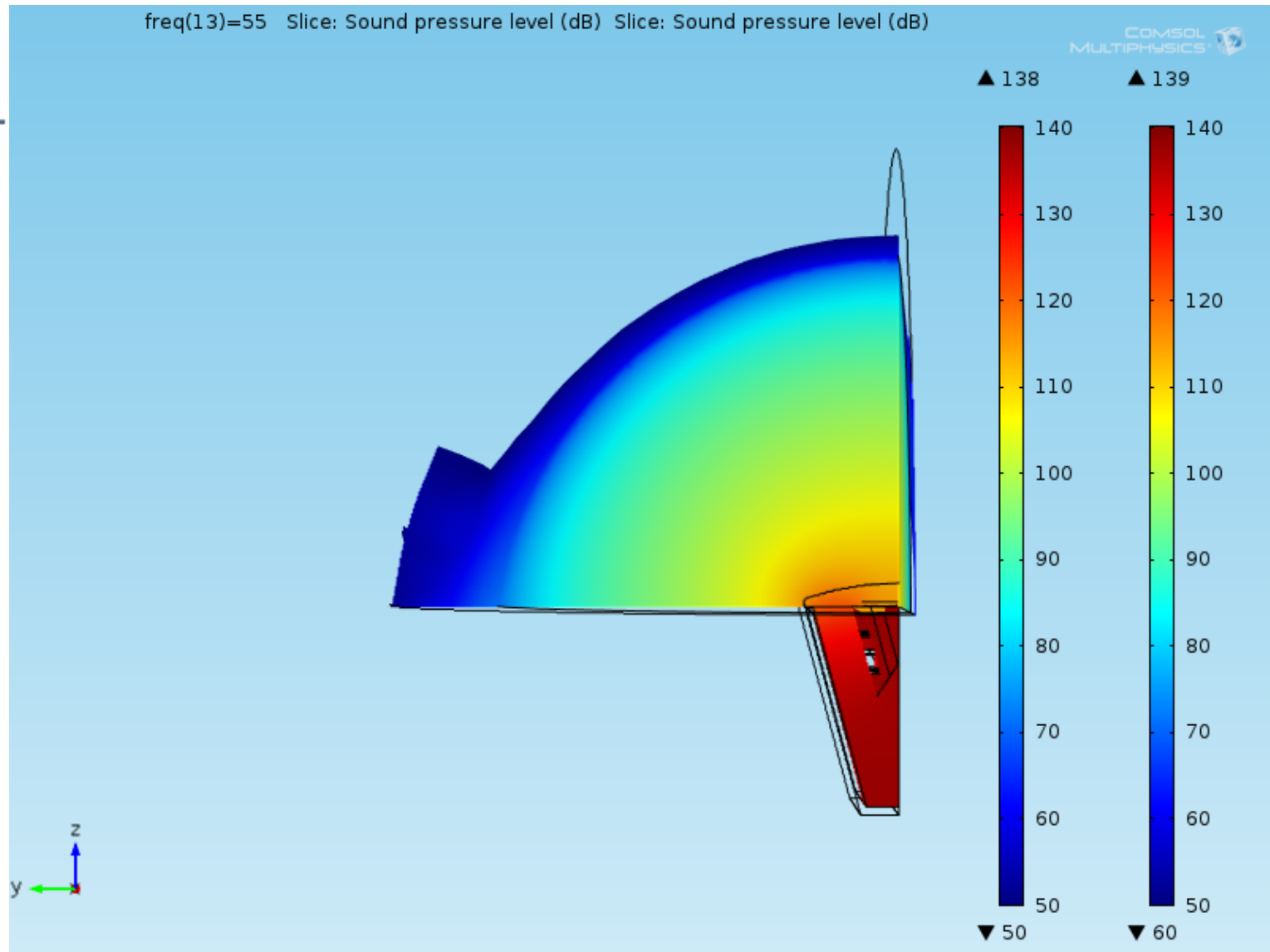
Community Professional Loudspeakers



Balistreri Riccardo

Loudspeaker Design Engineer

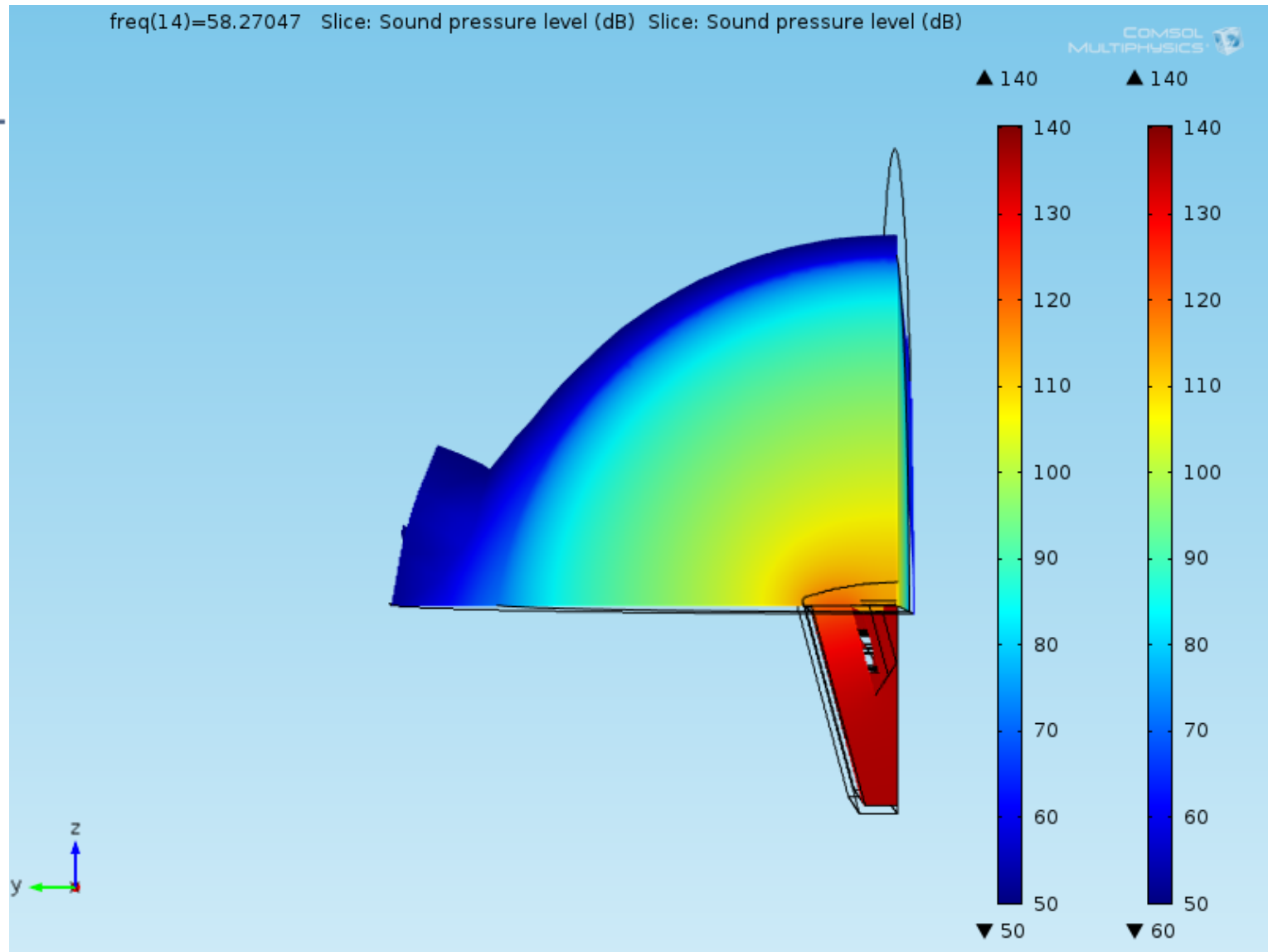
Community Professional Loudspeakers



Balistreri Riccardo

Loudspeaker Design Engineer

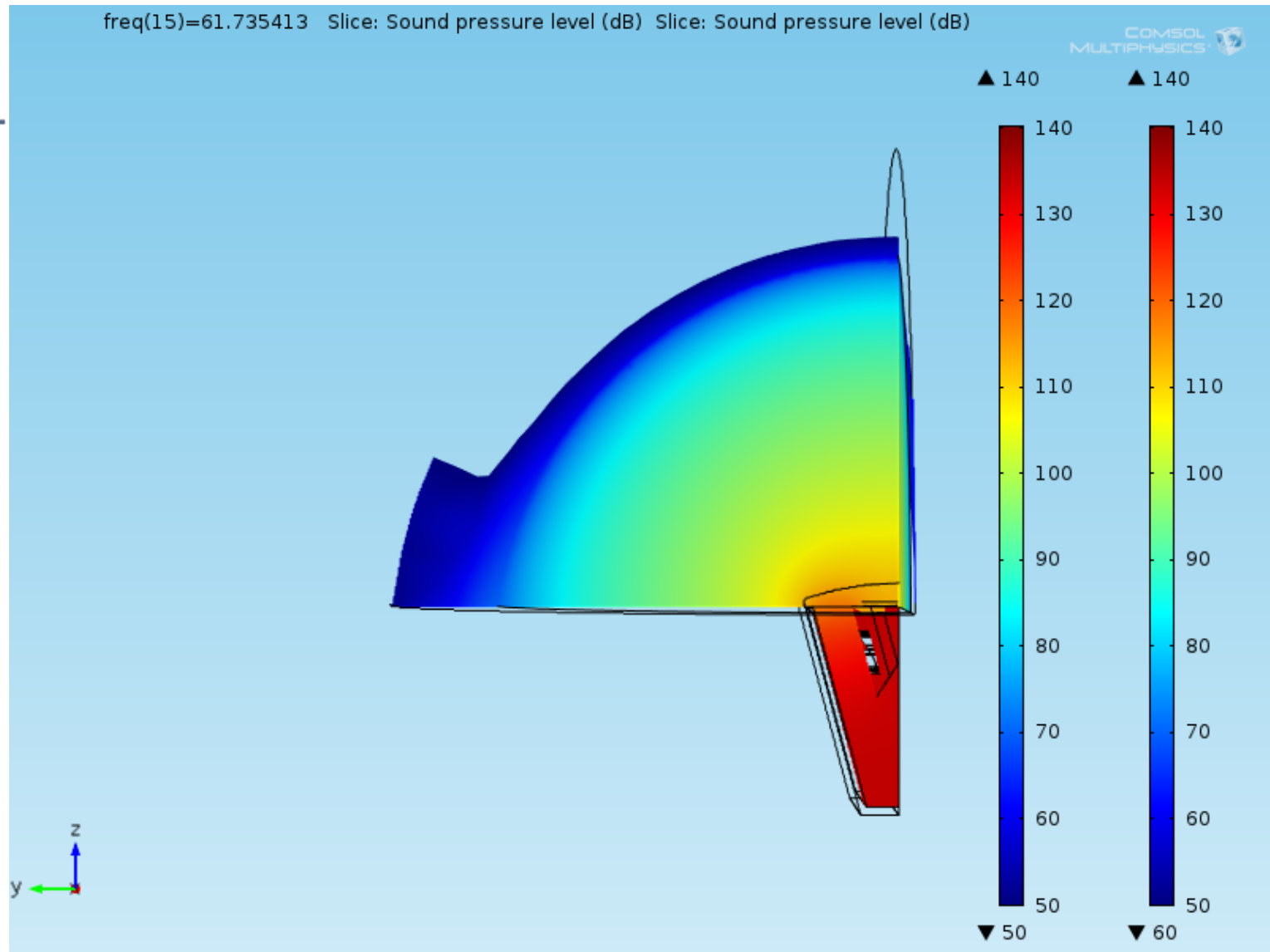
Community Professional Loudspeakers



Balistreri Riccardo

Loudspeaker Design Engineer

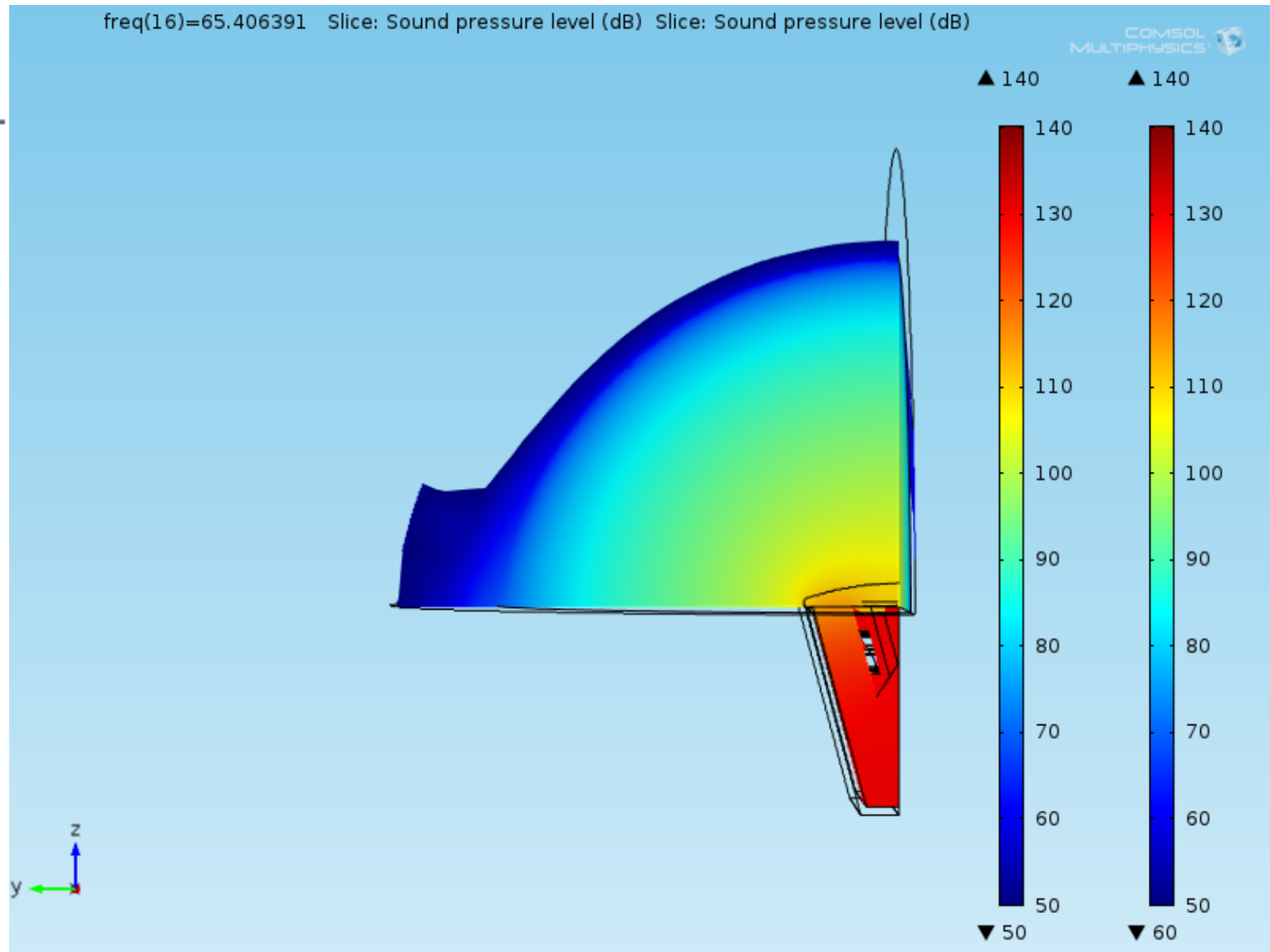
Community Professional Loudspeakers



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

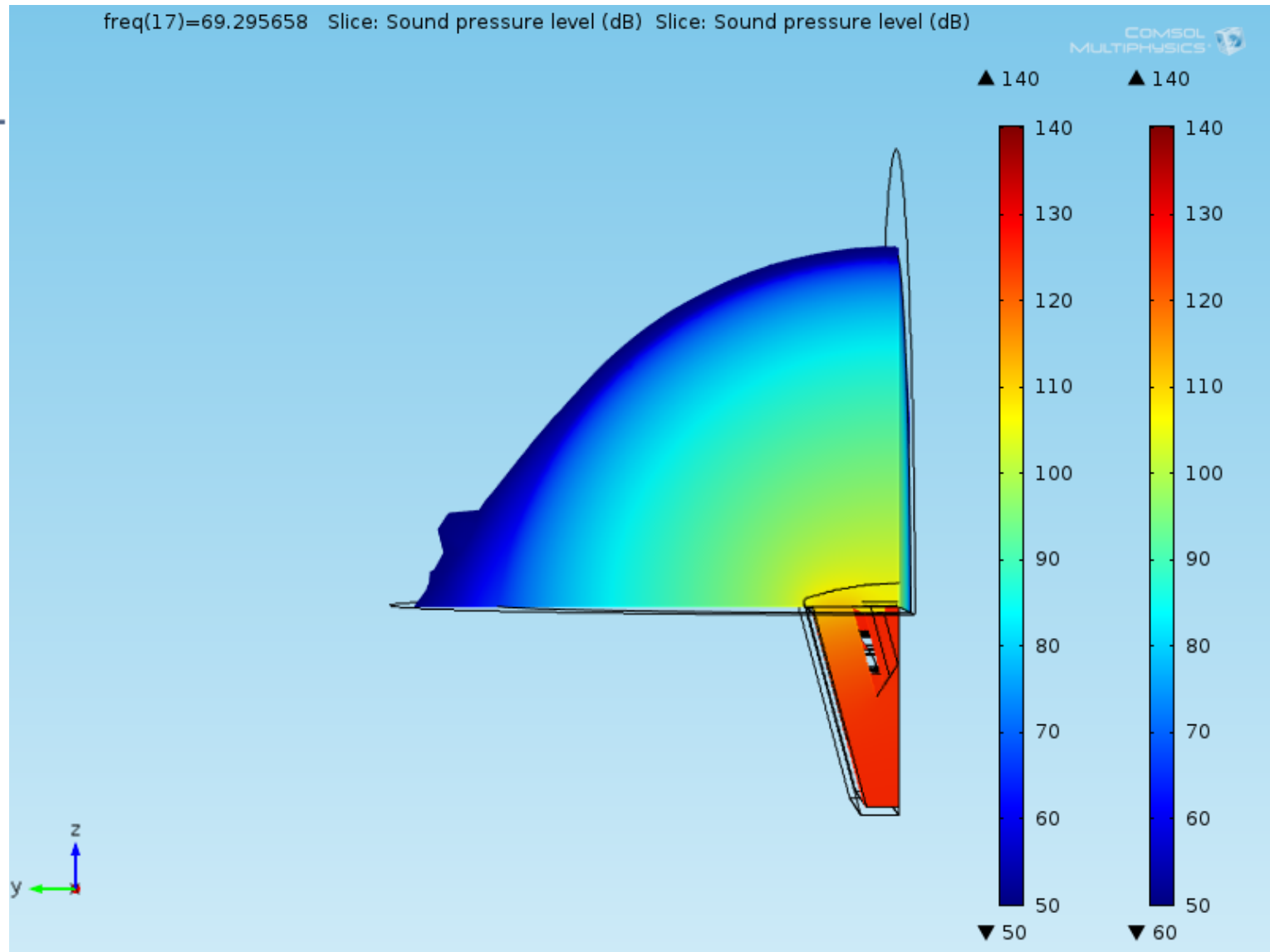


Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

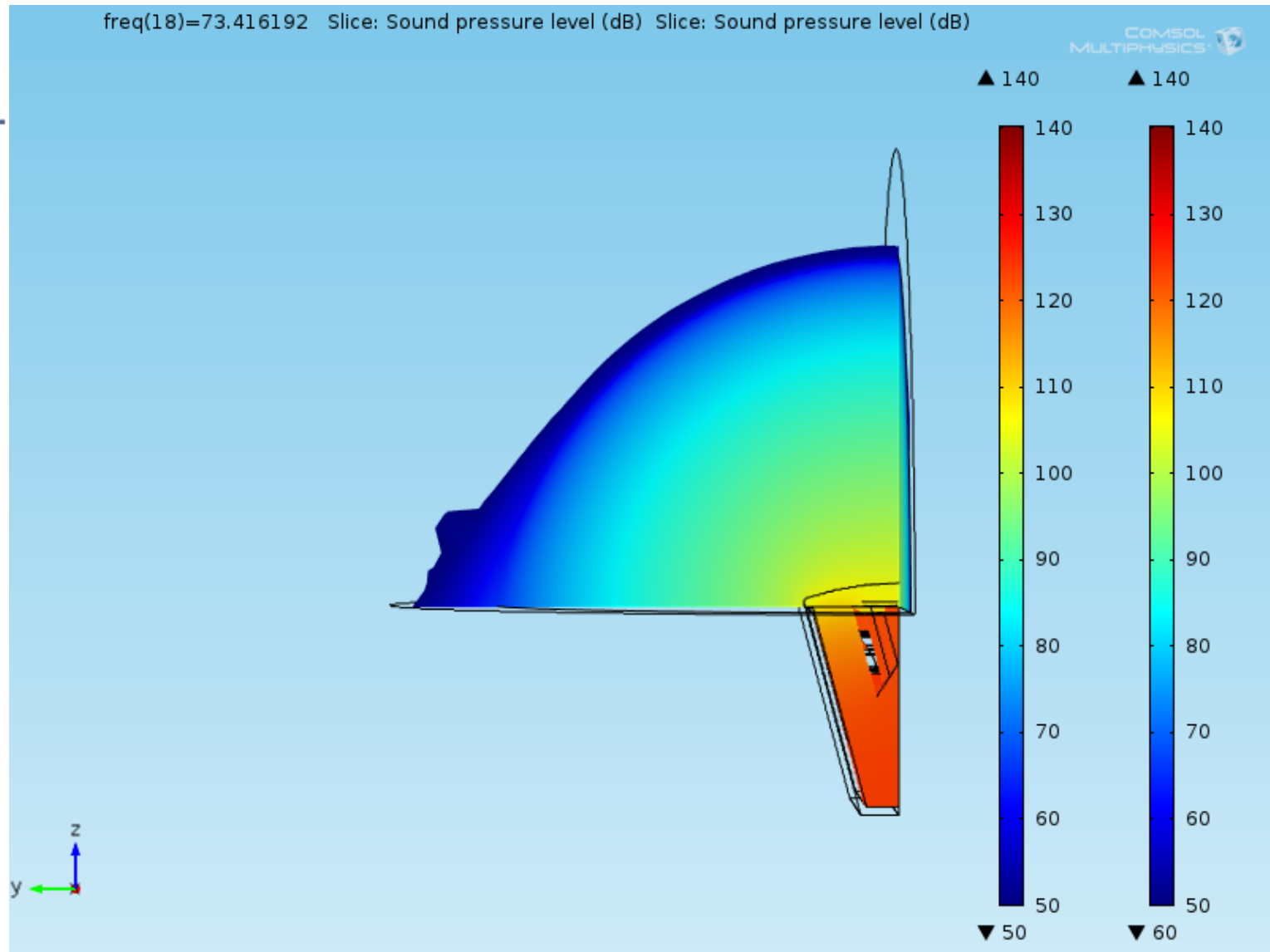




Balistreri Riccardo

Loudspeaker Design Engineer

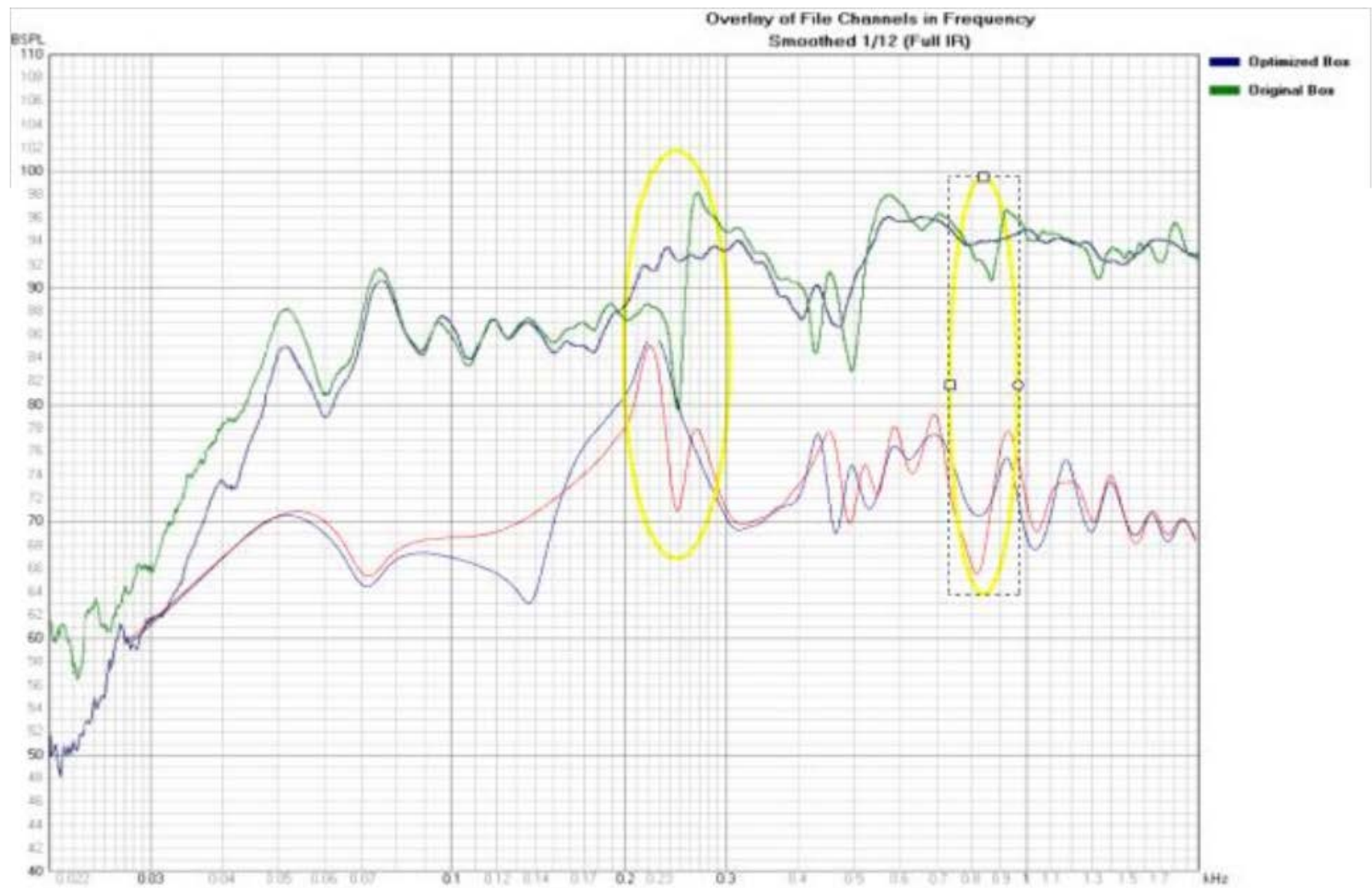
Community Professional Loudspeakers



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers



Balistreri Riccardo

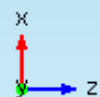
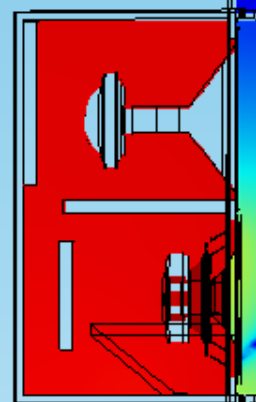
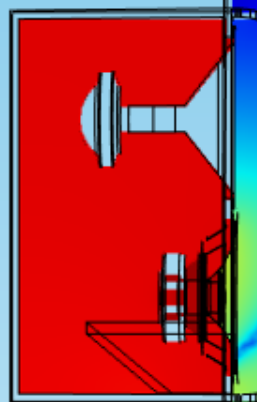
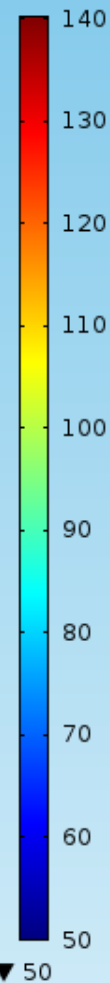
Loudspeaker Design Engineer

Community Professional Loudspeakers

freq(1)=27.5 Slice: Sound pressure level (dB)

freq(1)=27.5 Slice: Sound pressure level (dB)

▲ 137



Balistreri Riccardo

Loudspeaker Design Engineer

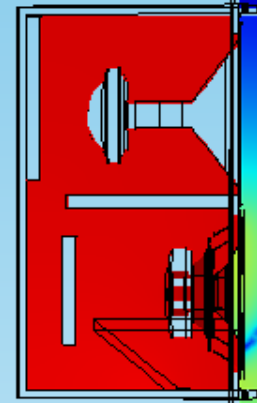
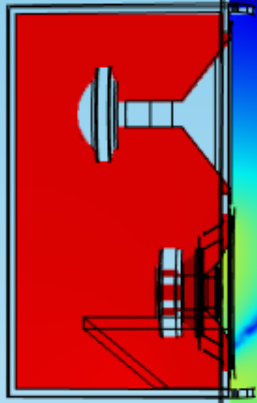
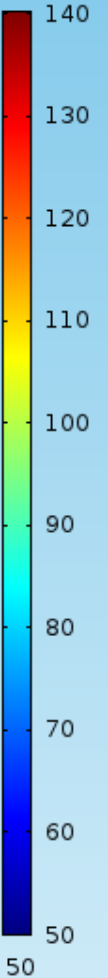
Community Professional Loudspeakers

Comparison between the  
two models

freq(2)=29.135235 Slice: Sound pressure level (dB)

freq(2)=29.135235 Slice: Sound pressure level (dB)

▲ 138



Balistreri Riccardo

Loudspeaker Design Engineer

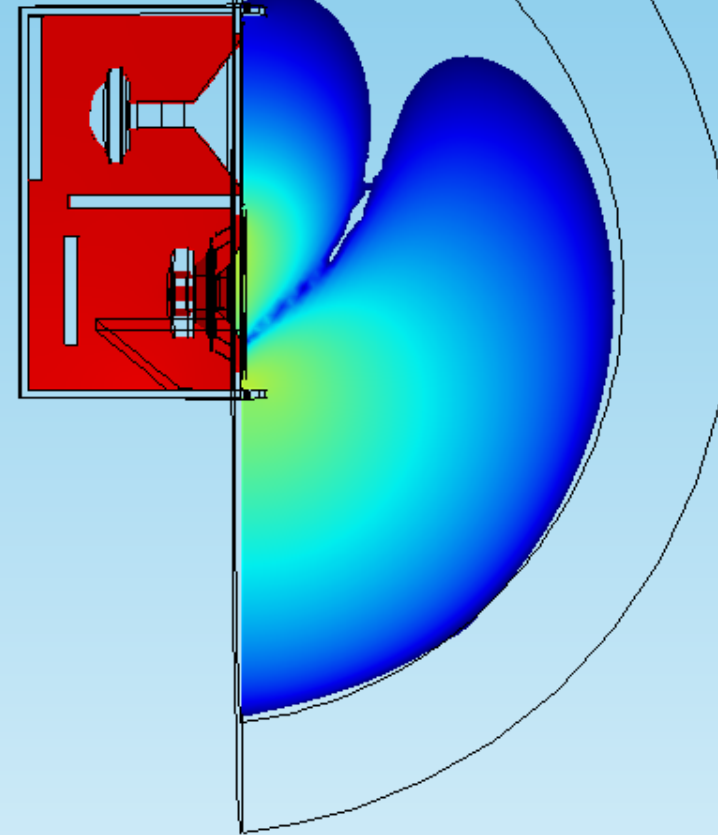
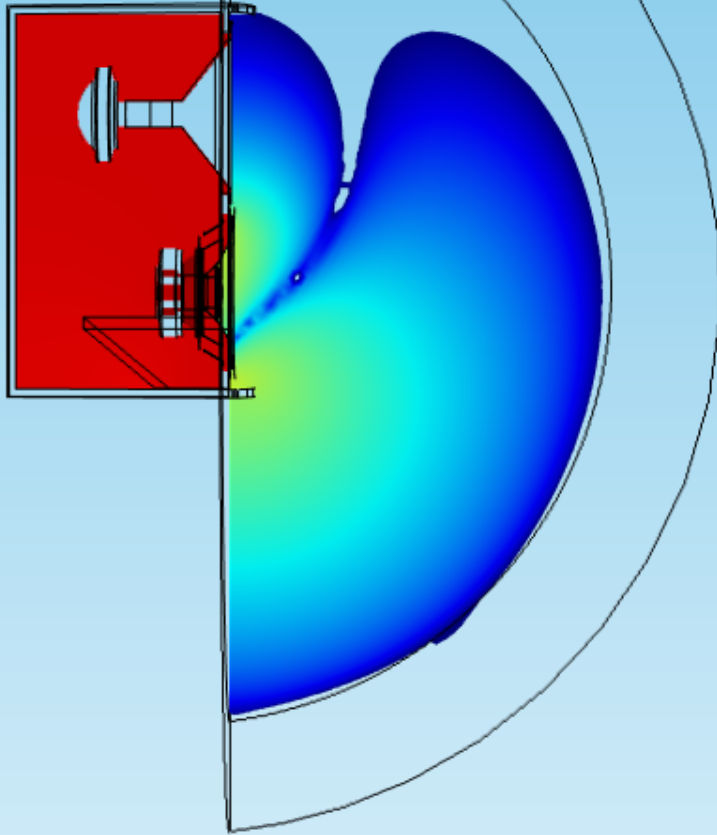
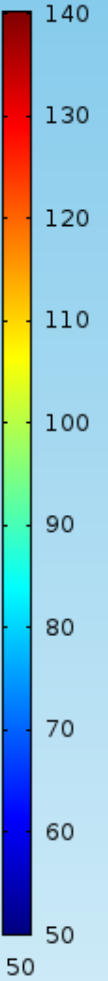
Community Professional Loudspeakers

Comparison between the  
two models

freq(3)=30.867706 Slice: Sound pressure level (dB)

freq(3)=30.867706 Slice: Sound pressure level (dB)

▲ 138



Balistreri Riccardo

Loudspeaker Design Engineer

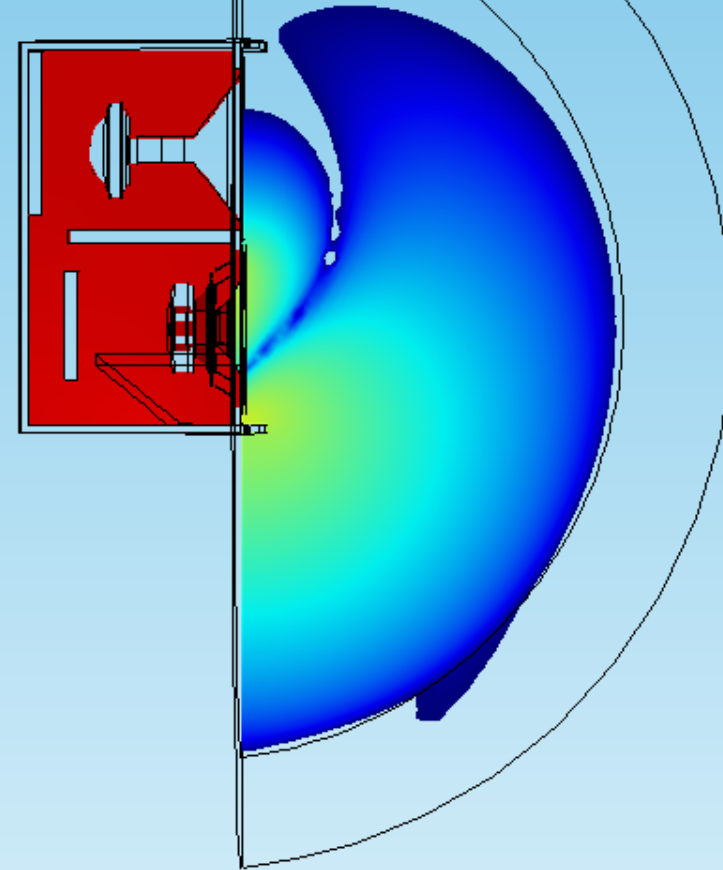
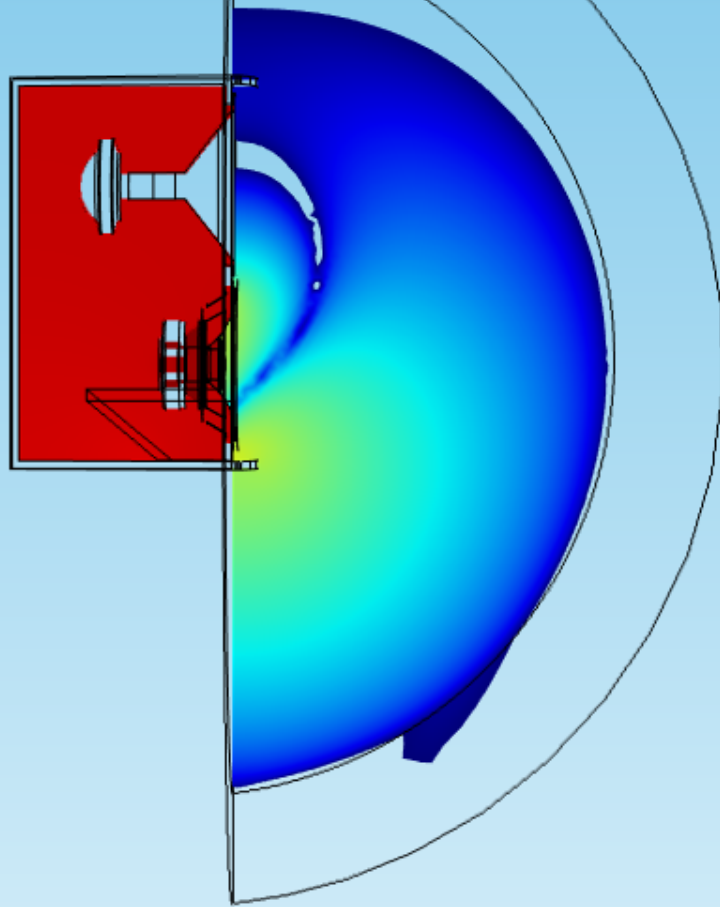
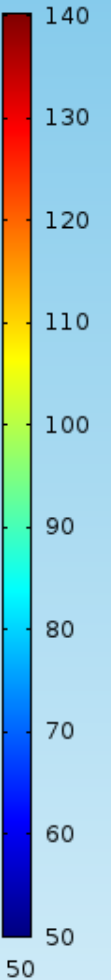
Community Professional Loudspeakers

Comparison between the  
two models

freq(4)=32.703196 Slice: Sound pressure level (dB)

freq(4)=32.703196 Slice: Sound pressure level (dB)

▲ 139



Balistreri Riccardo

Loudspeaker Design Engineer

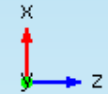
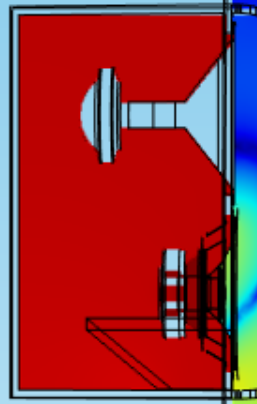
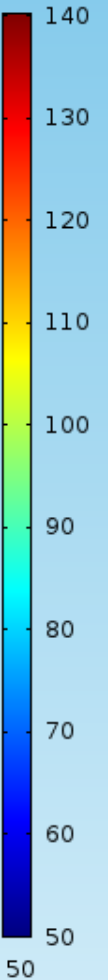
Community Professional Loudspeakers

Comparison between the  
two models

freq(5)=34.647829 Slice: Sound pressure level (dB)

freq(5)=34.647829 Slice: Sound pressure level (dB)

▲ 139



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

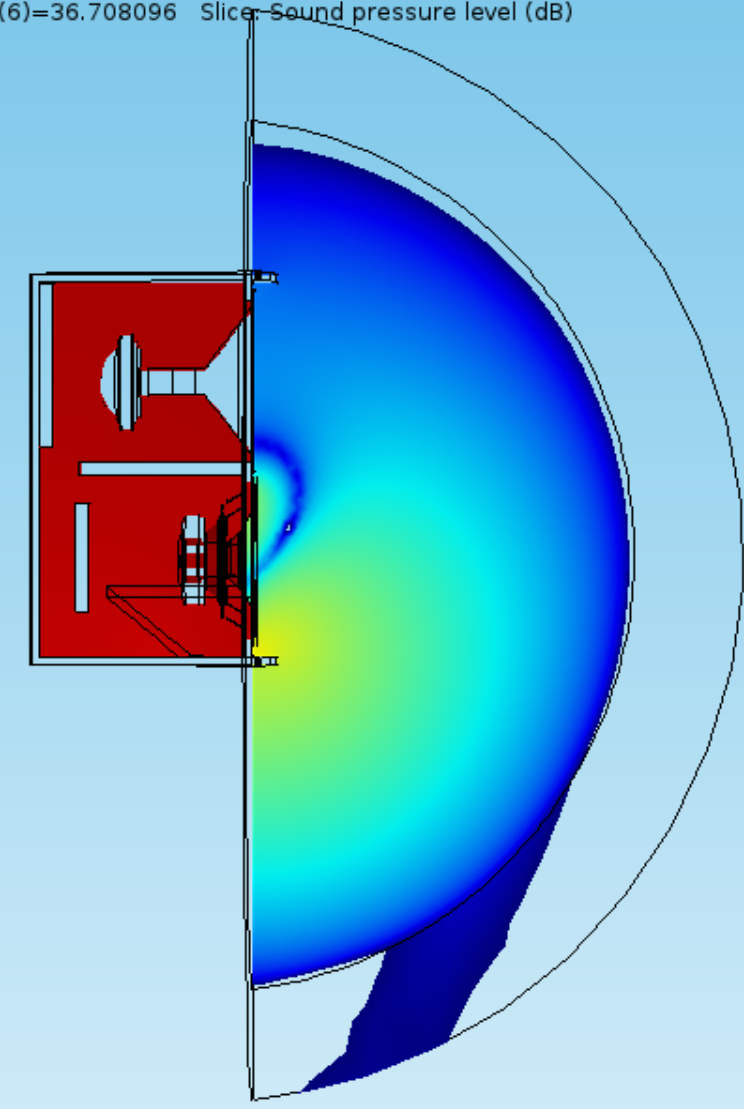
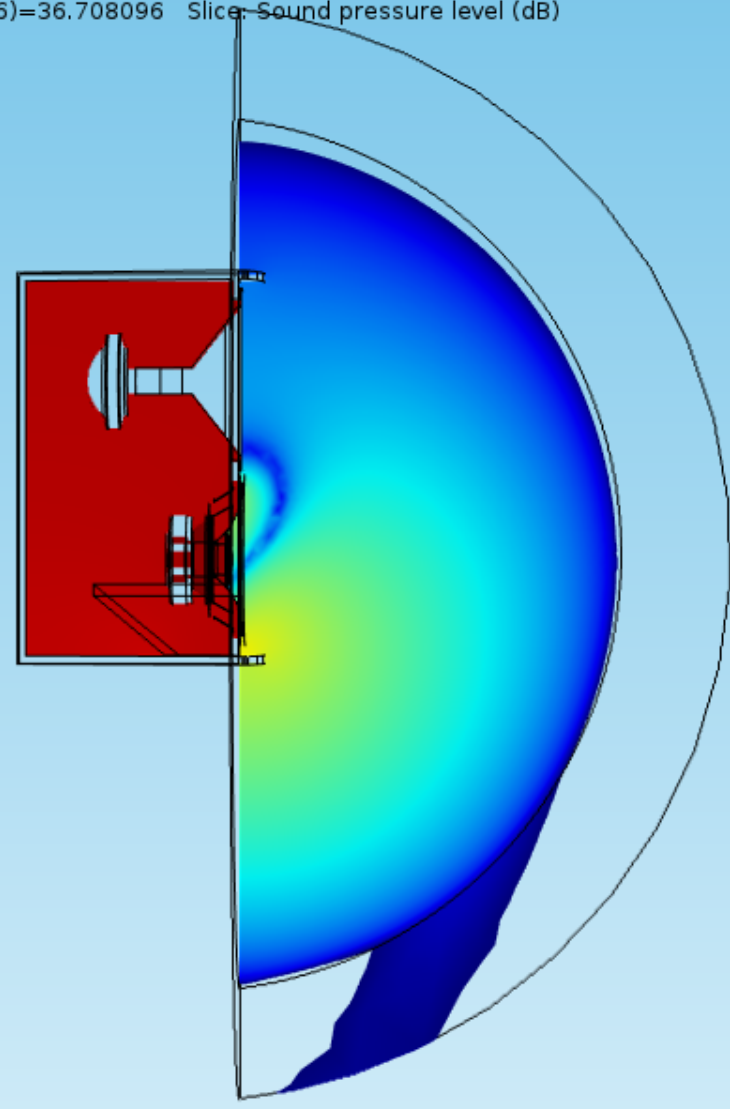
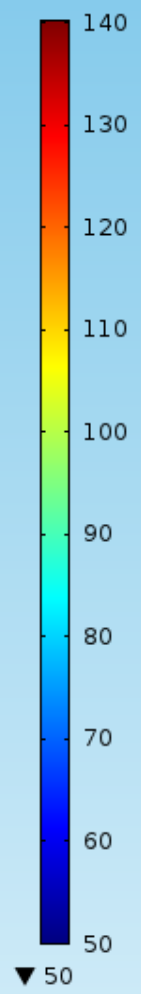
Comparison between the  
two models



freq(6)=36.708096 Slice: Sound pressure level (dB)

freq(6)=36.708096 Slice: Sound pressure level (dB)

▲ 140



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the two models

freq(7)=38.890873 Slice: Sound pressure level (dB)

freq(7)=38.890873 Slice: Sound pressure level (dB)

COMSOL  
MULTIPHYSICS

▲ 140

140

130

120

110

100

90

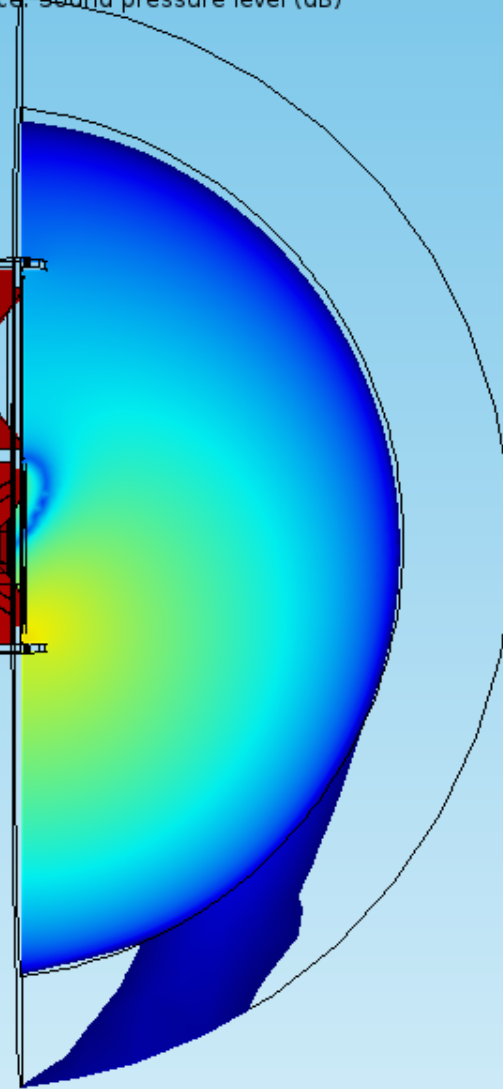
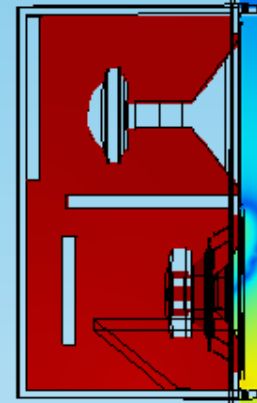
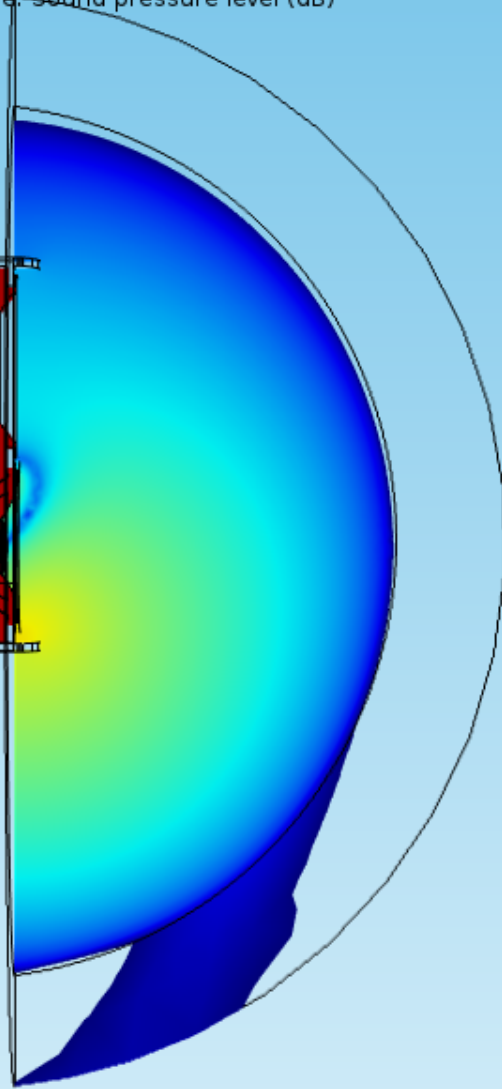
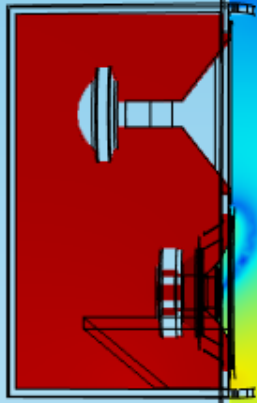
80

70

60

50

▼ 50



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

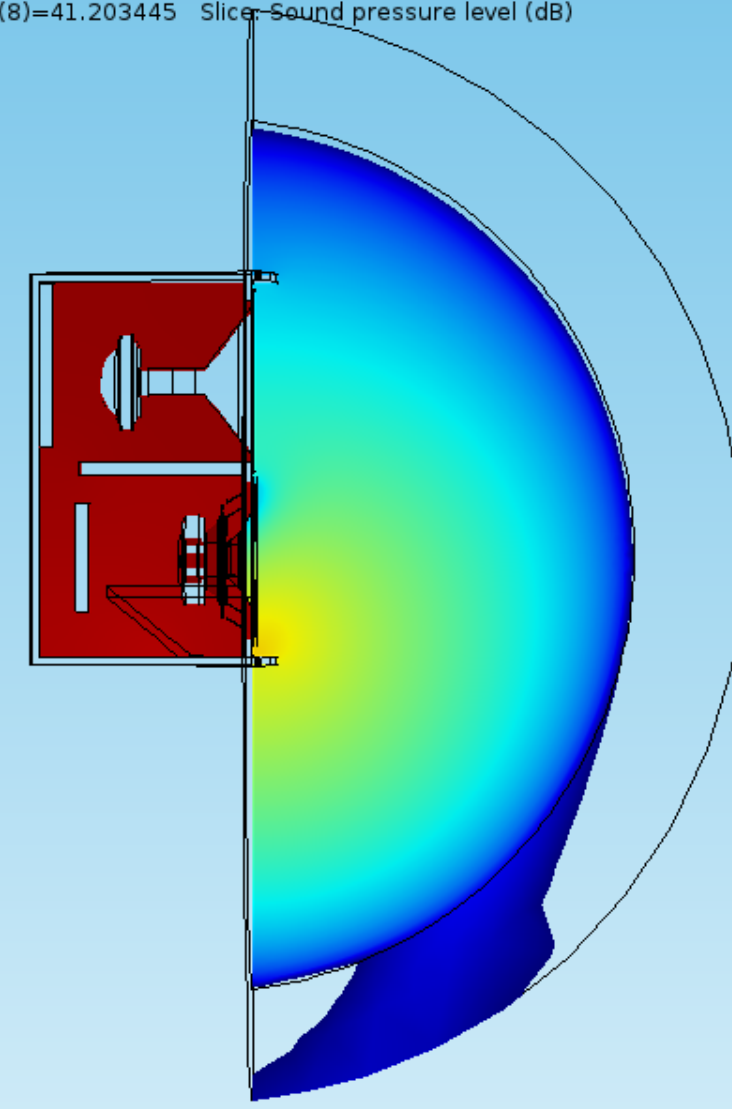
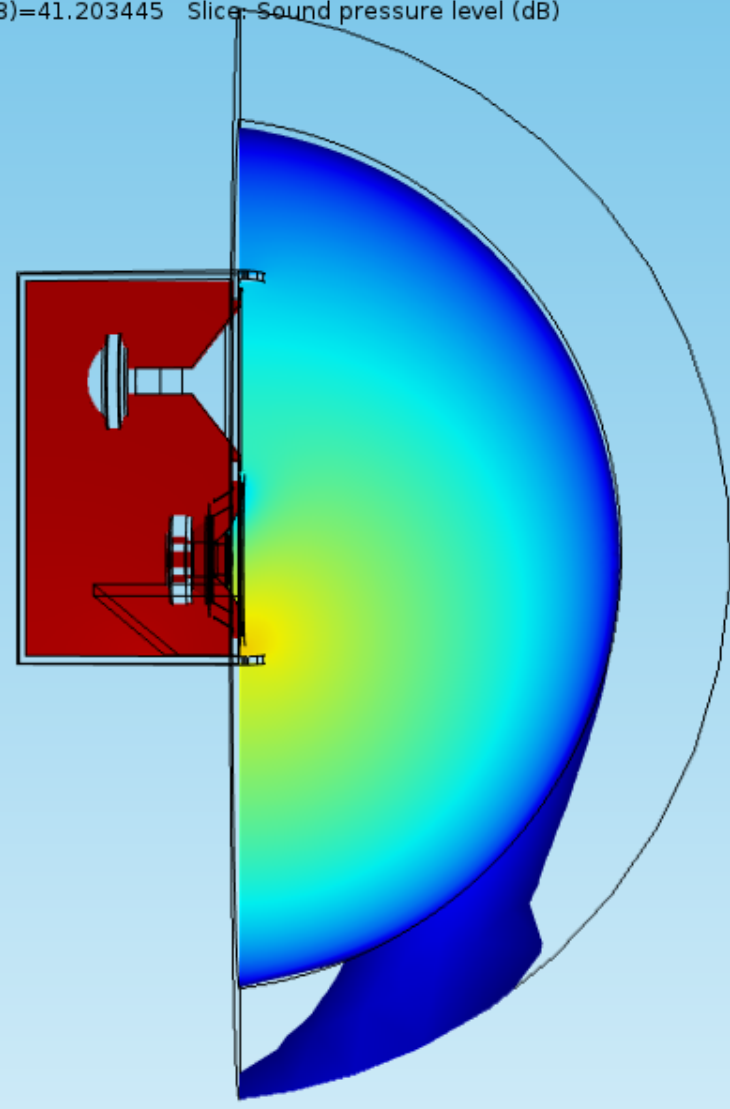
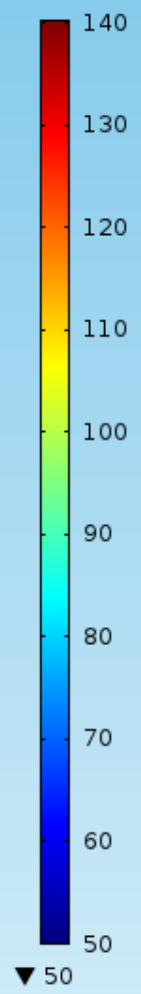
Comparison between the  
two models



freq(8)=41.203445 Slice: Sound pressure level (dB)

freq(8)=41.203445 Slice: Sound pressure level (dB)

▲ 140



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the two models

freq(9)=43.653529 Slice: Sound pressure level (dB)

freq(9)=43.653529 Slice: Sound pressure level (dB)

COMSOL  
MULTIPHYSICS

▲ 139

140

130

120

110

100

90

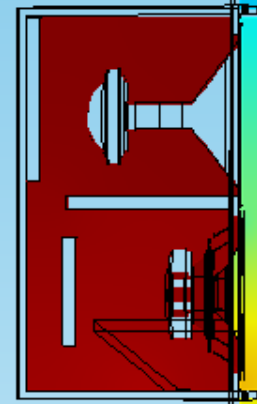
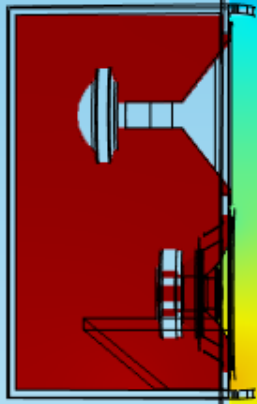
80

70

60

50

▼ 50



Balistreri Riccardo

Loudspeaker Design Engineer

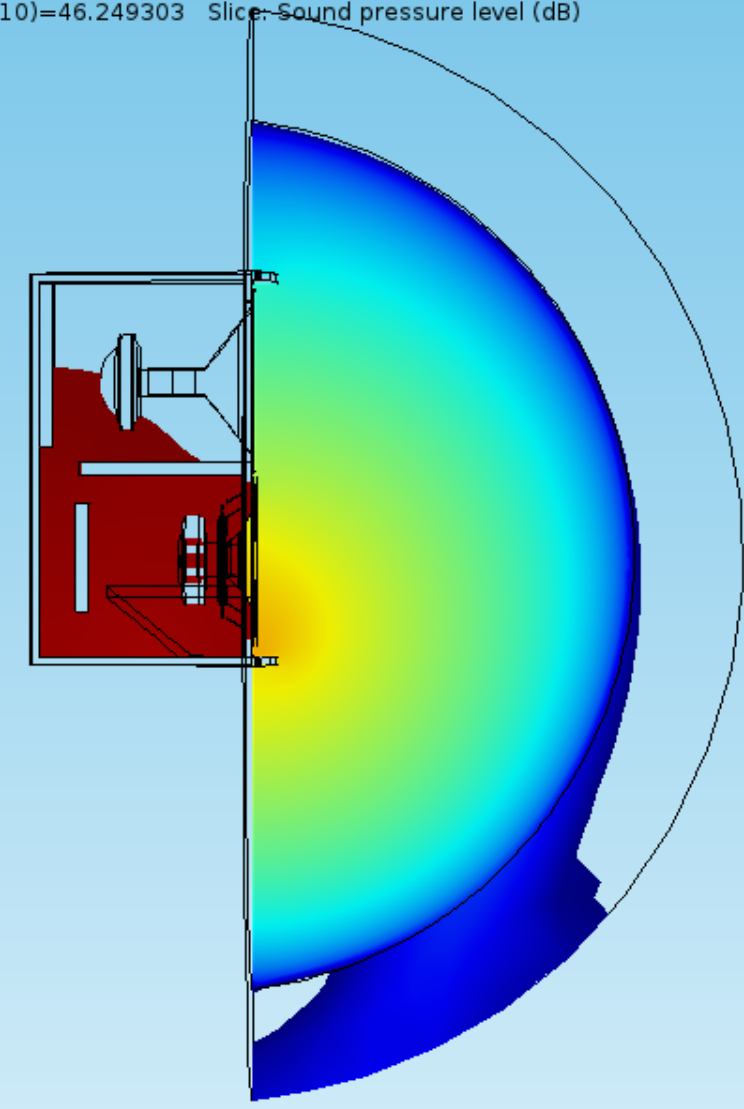
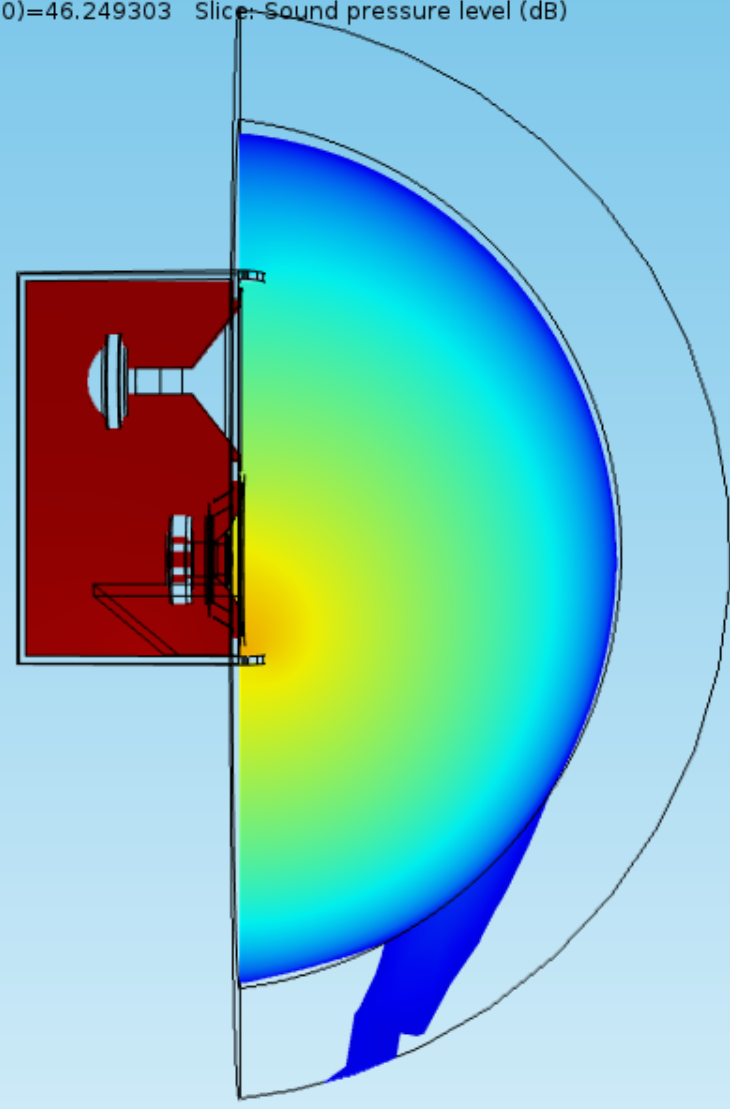
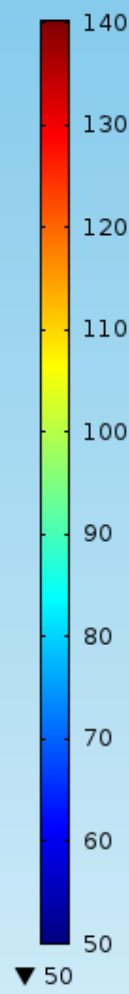
Community Professional Loudspeakers

Comparison between the  
two models

freq(10)=46.249303 Slice: Sound pressure level (dB)

freq(10)=46.249303 Slice: Sound pressure level (dB)

▲ 140



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

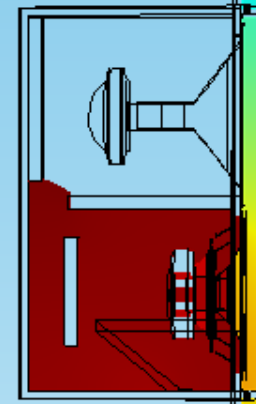
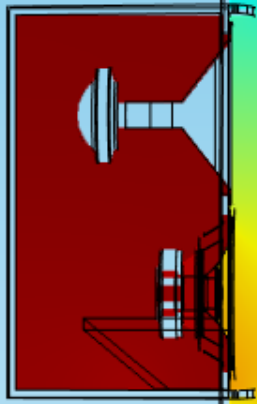
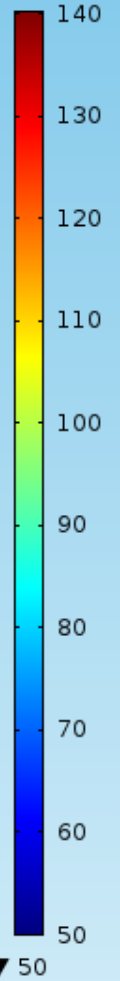
Comparison between the two models

freq(11)=48.99943 Slice: Sound pressure level (dB)

freq(11)=48.99943 Slice: Sound pressure level (dB)

COMSOL  
MULTIPHYSICS

▲ 140



Balistreri Riccardo

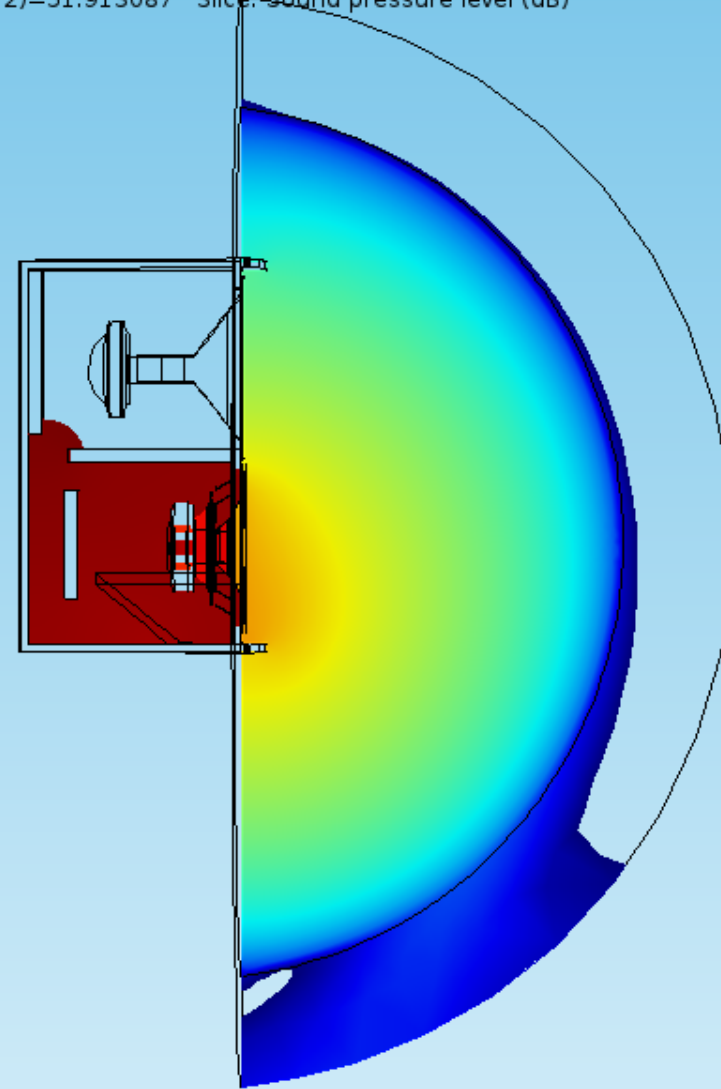
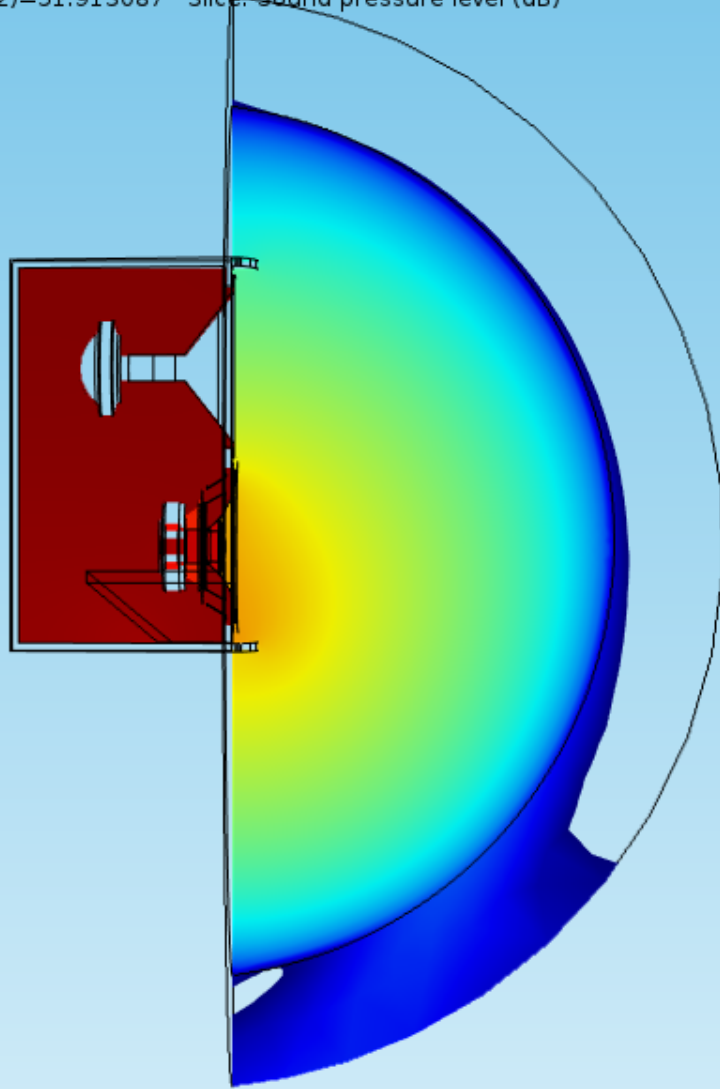
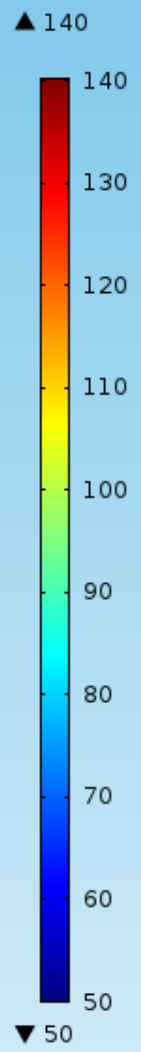
Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the  
two models

freq(12)=51.913087 Slice: Sound pressure level (dB)

freq(12)=51.913087 Slice: Sound pressure level (dB)



Balistreri Riccardo

Loudspeaker Design Engineer

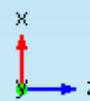
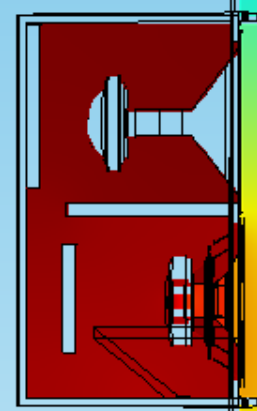
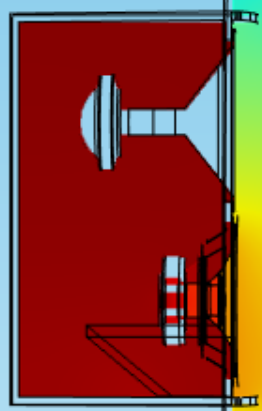
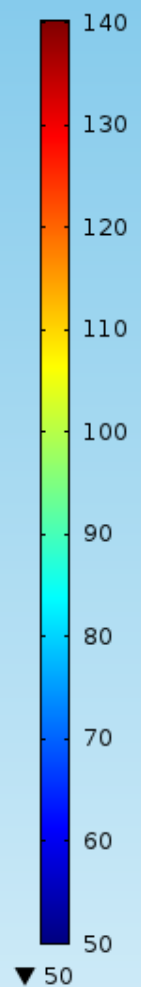
Community Professional Loudspeakers

Comparison between the  
two models

freq(13)=55 Slice: Sound pressure level (dB)

freq(13)=55 Slice: Sound pressure level (dB)

▲ 140



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

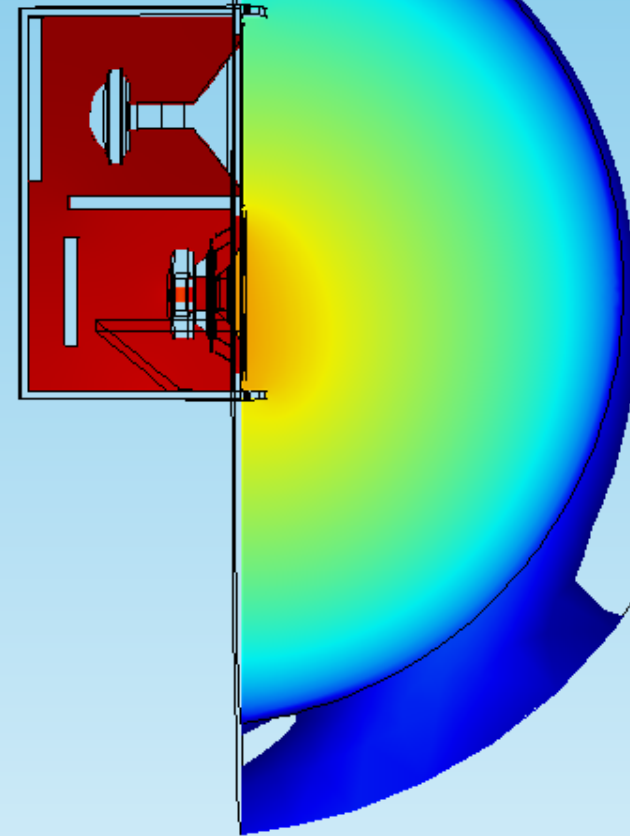
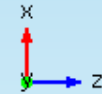
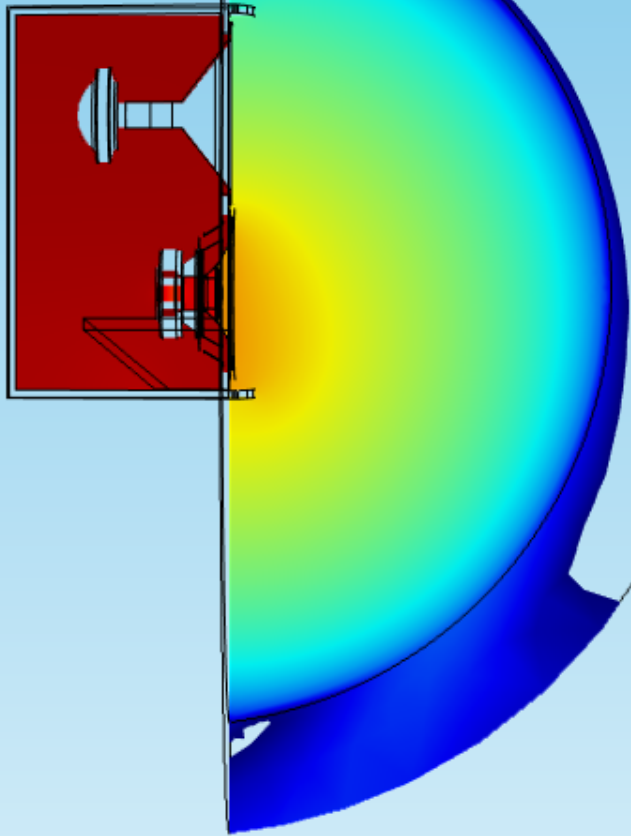
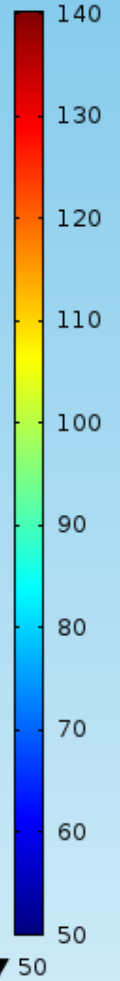
Comparison between the two models



freq(14)=58.27047 Slice: Sound pressure level (dB)

freq(14)=58.27047 Slice: Sound pressure level (dB)

▲ 140



Balistreri Riccardo

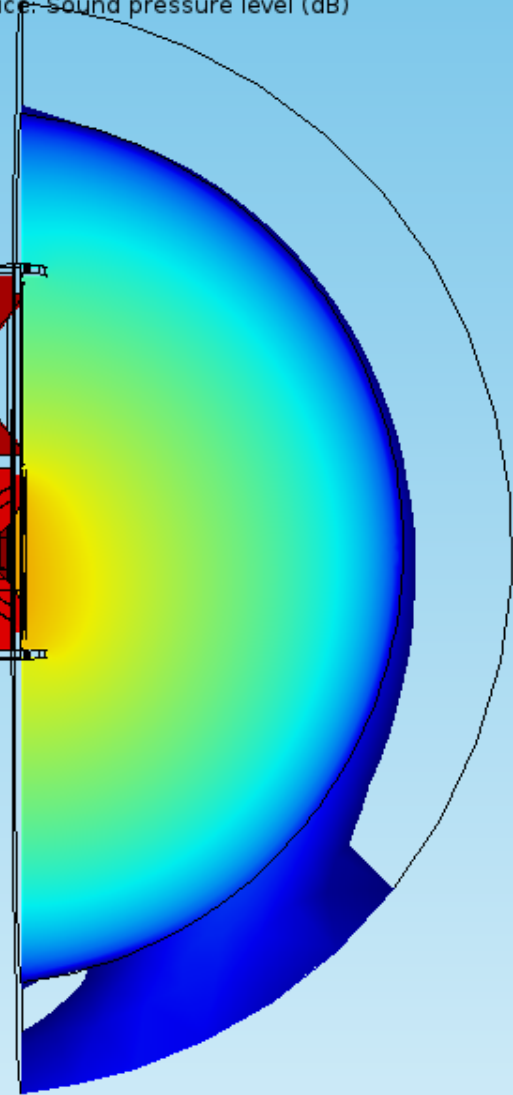
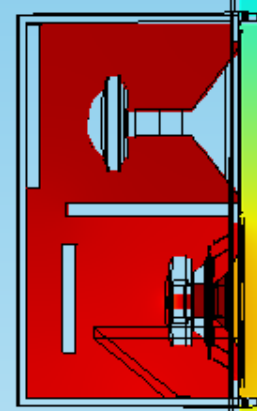
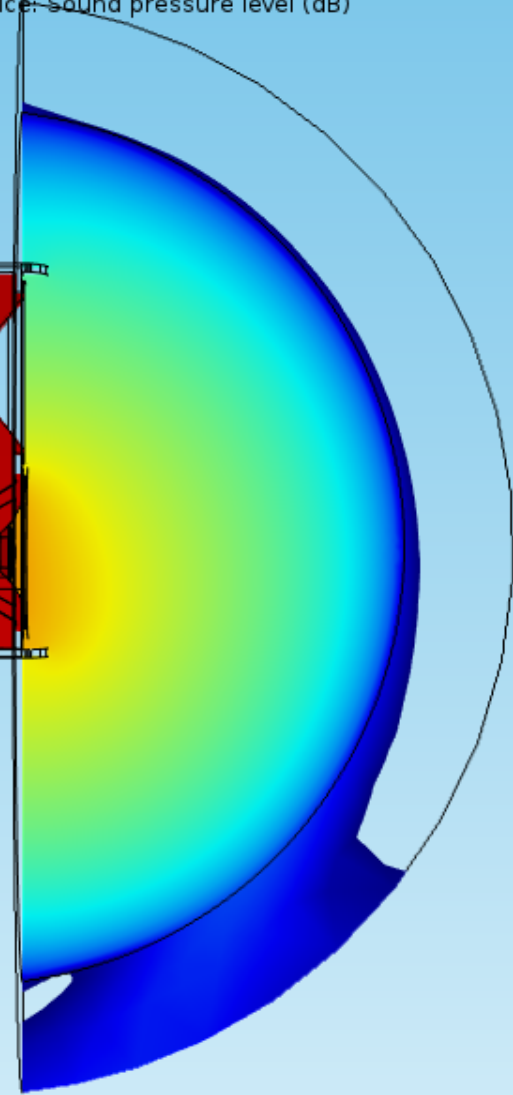
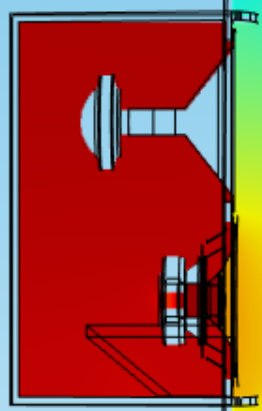
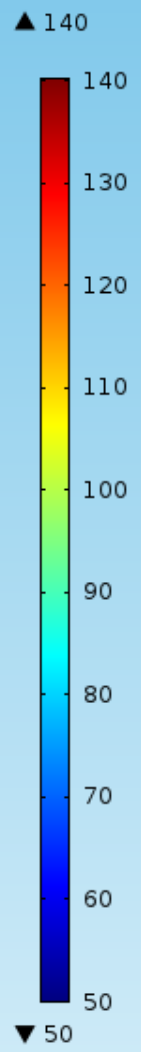
Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the  
two models

freq(15)=61.735413 Slice: Sound pressure level (dB)

freq(15)=61.735413 Slice: Sound pressure level (dB)



Balistreri Riccardo

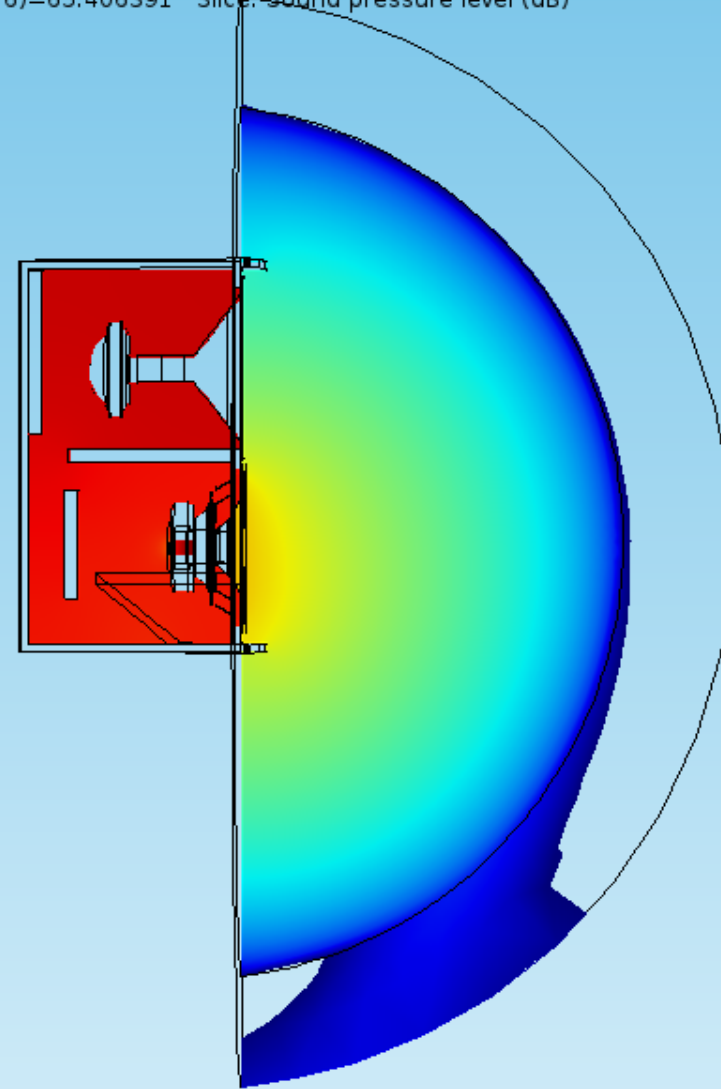
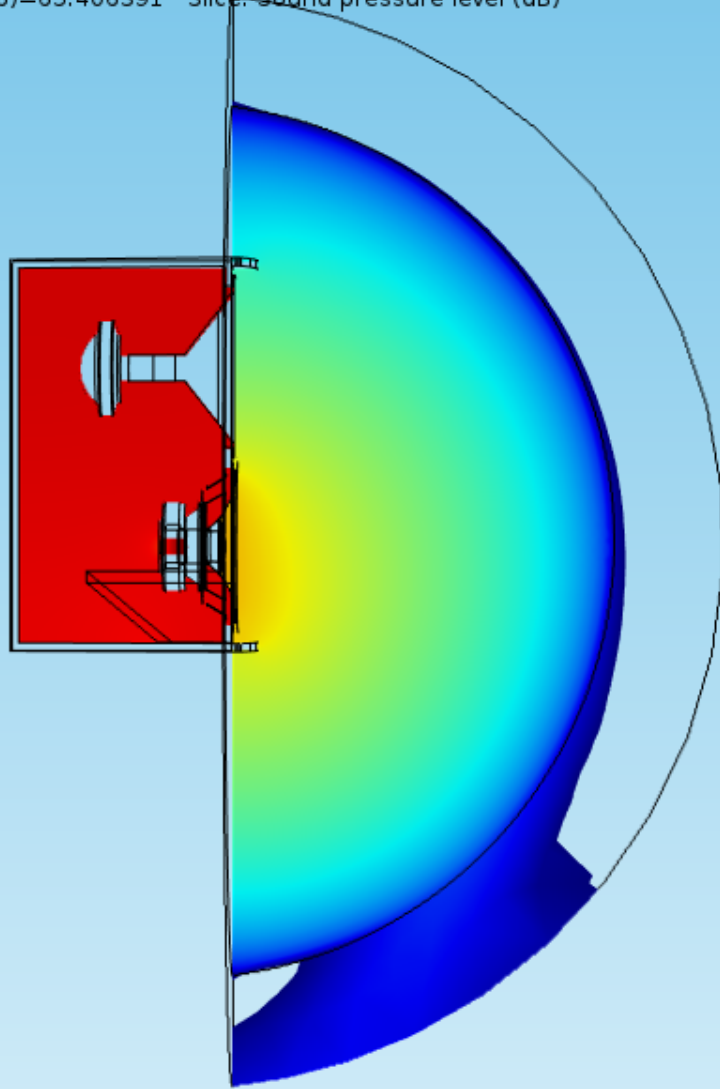
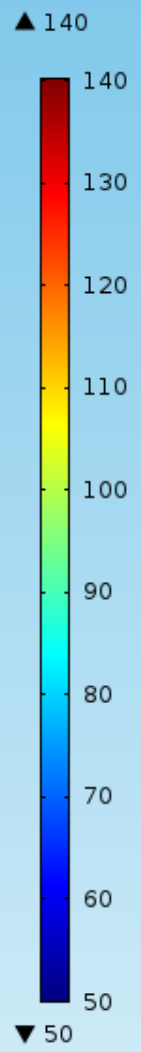
Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the two models

freq(16)=65.406391 Slice: Sound pressure level (dB)

freq(16)=65.406391 Slice: Sound pressure level (dB)



Balistreri Riccardo

Loudspeaker Design Engineer

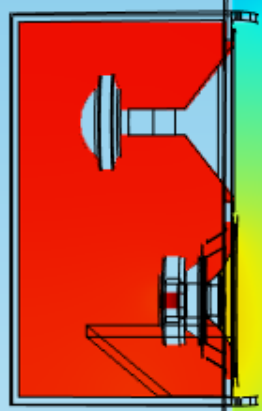
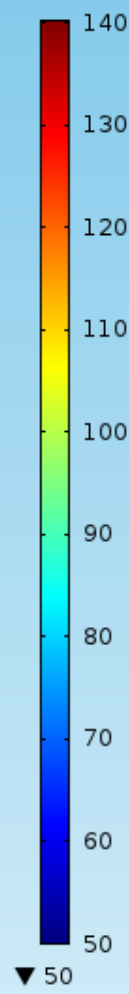
Community Professional Loudspeakers

Comparison between the two models

freq(17)=69.295658 Slice: Sound pressure level (dB)

freq(17)=69.295658 Slice: Sound pressure level (dB)

▲ 140



Balistreri Riccardo

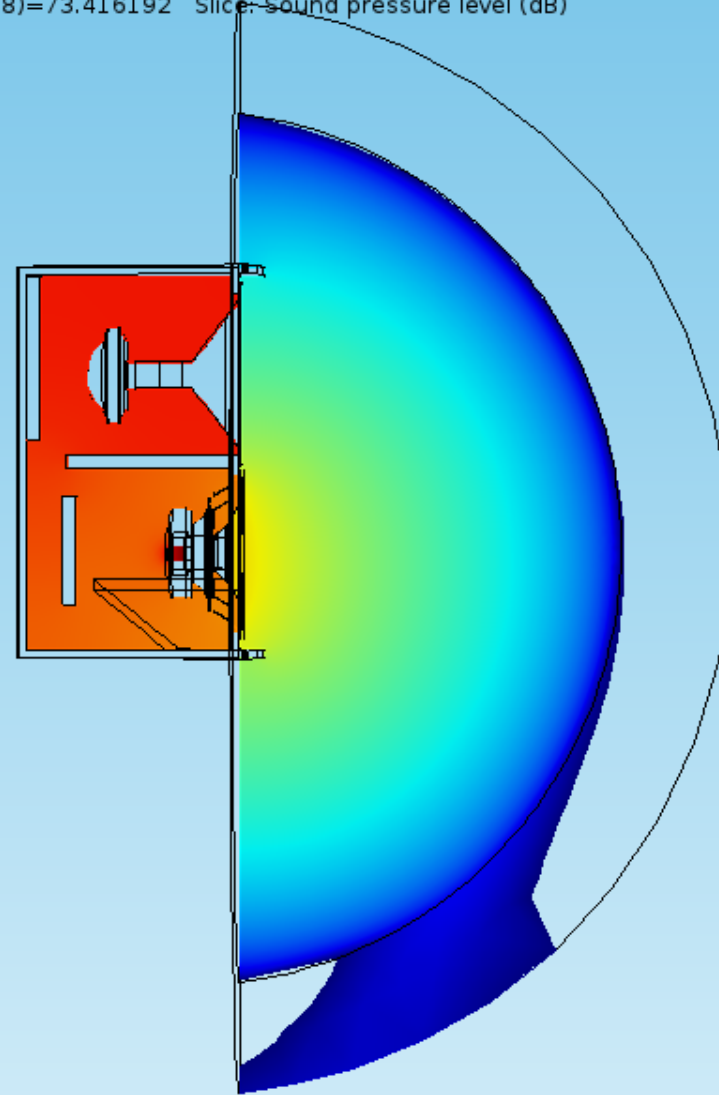
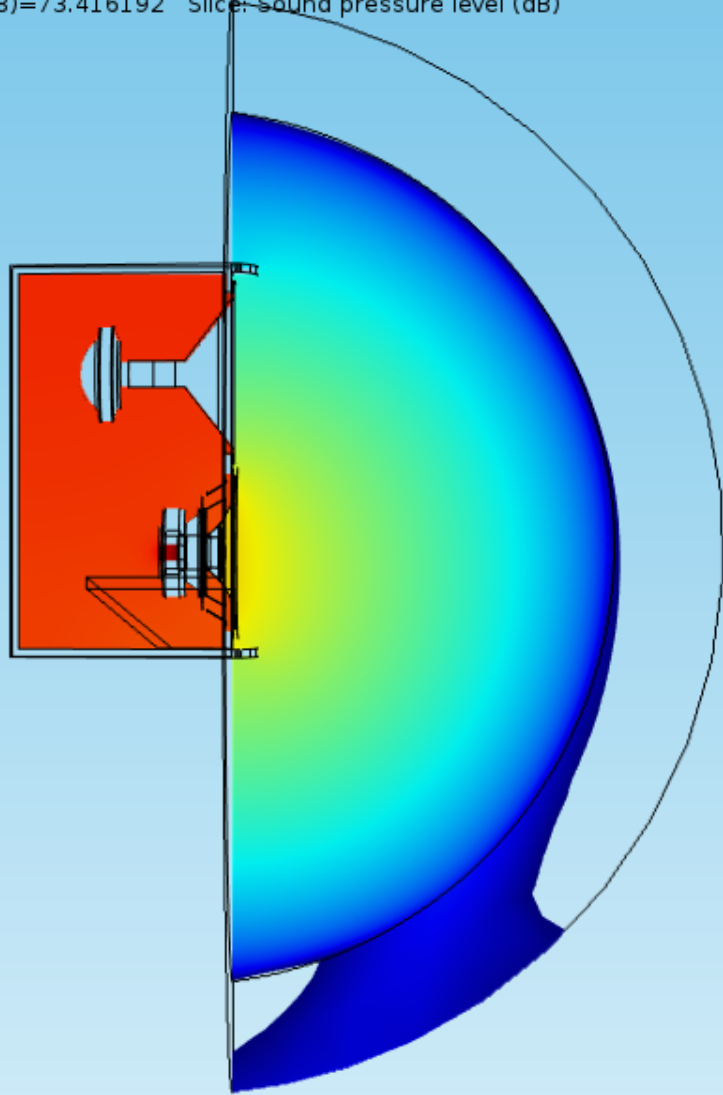
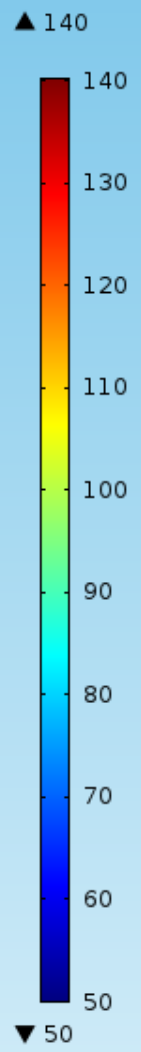
Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the two models

freq(18)=73.416192 Slice: Sound pressure level (dB)

freq(18)=73.416192 Slice: Sound pressure level (dB)



Balistreri Riccardo

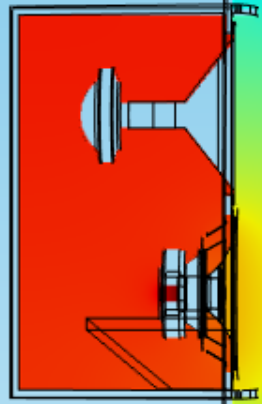
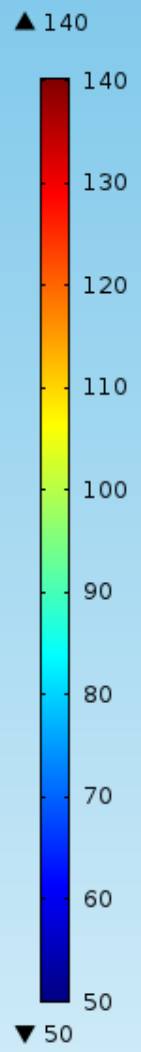
Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the two models

freq(19)=77.781746 Slice: Sound pressure level (dB)

freq(19)=77.781746 Slice: Sound pressure level (dB)



Balistreri Riccardo

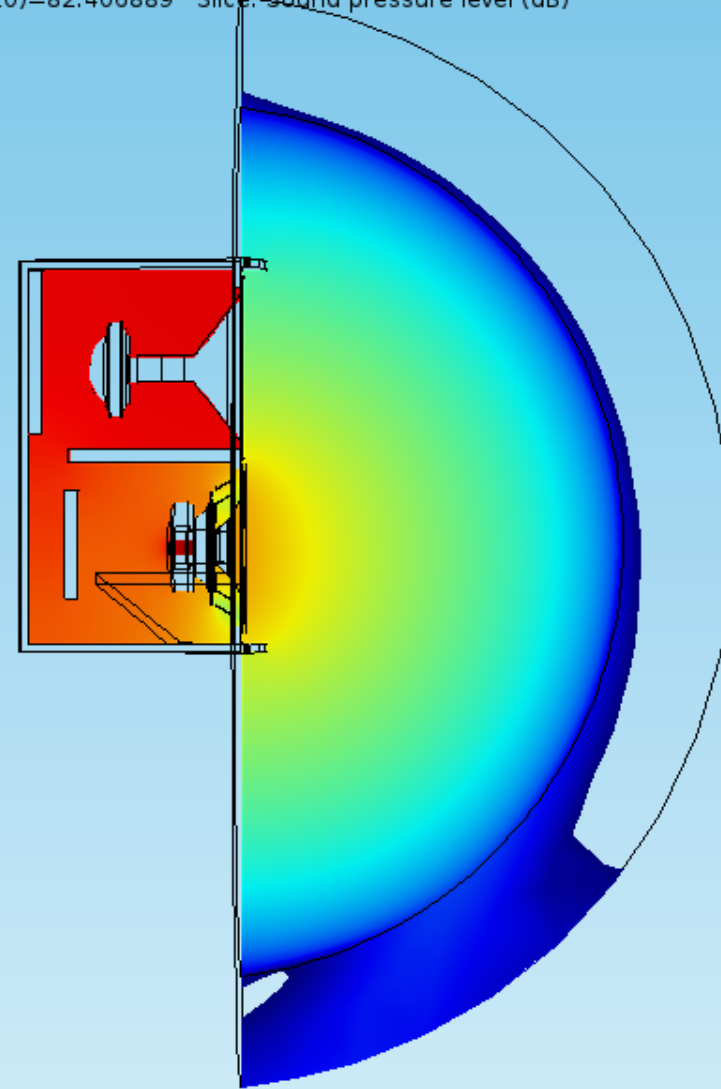
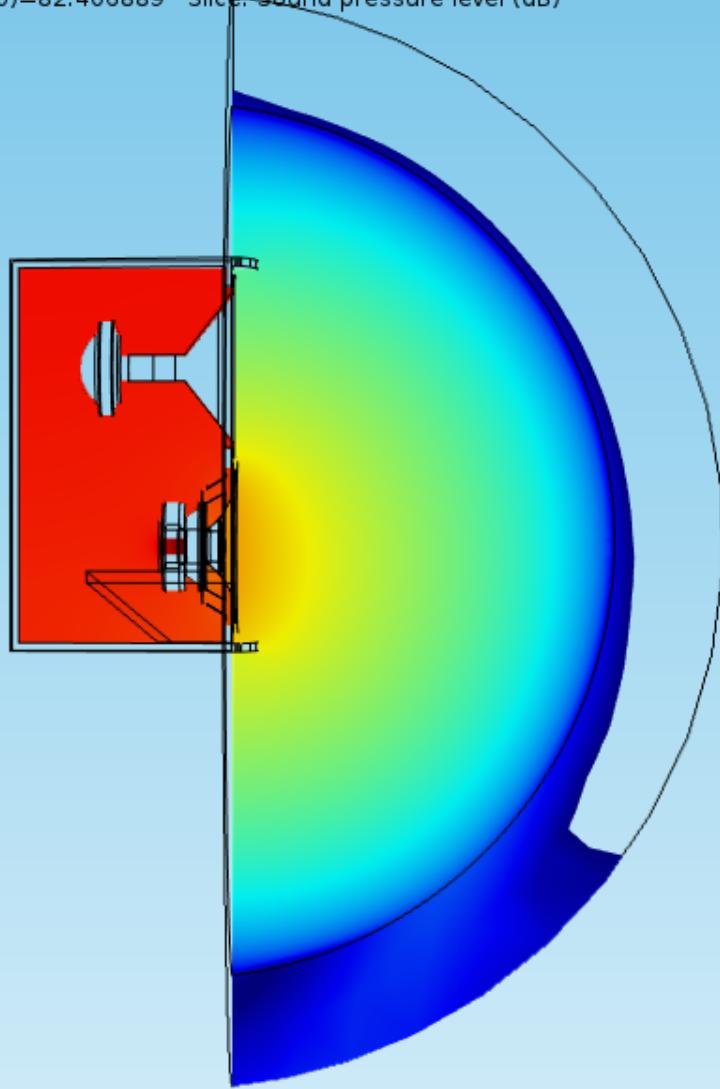
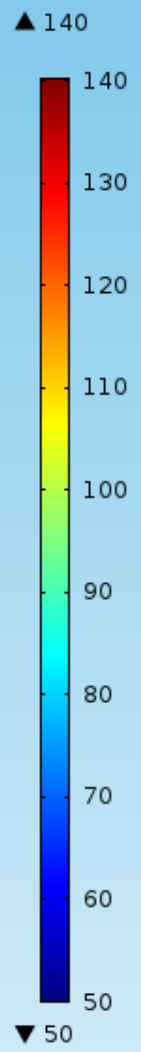
Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the two models

freq(20)=82.406889 Slice: Sound pressure level (dB)

freq(20)=82.406889 Slice: Sound pressure level (dB)



Balistreri Riccardo

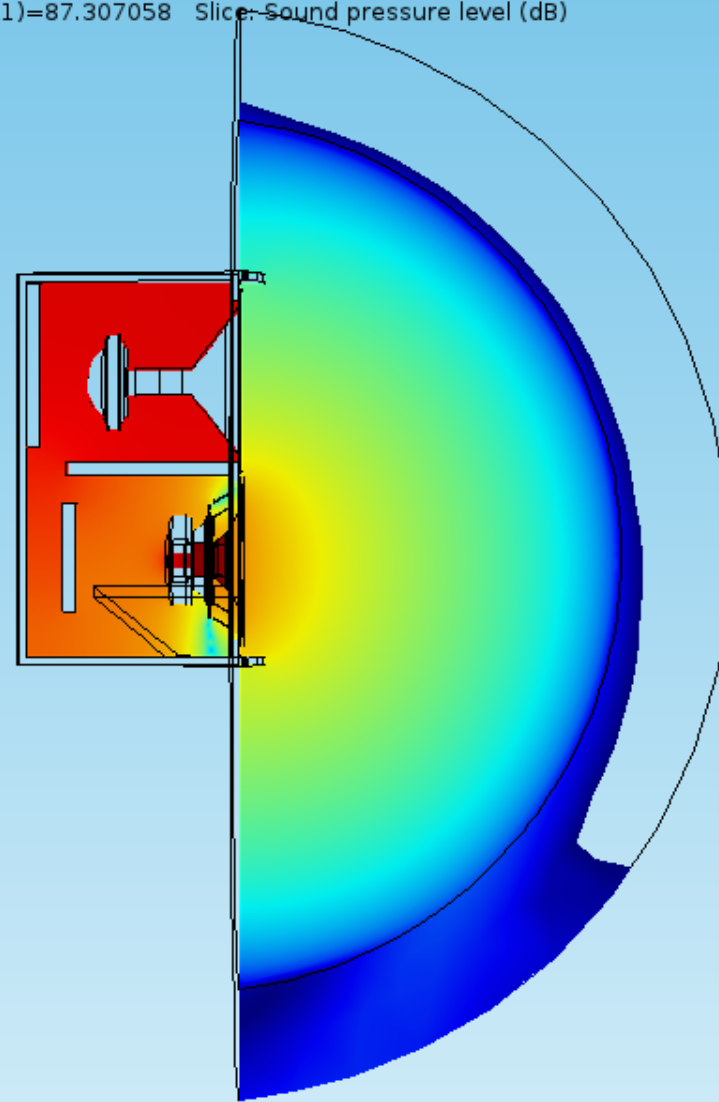
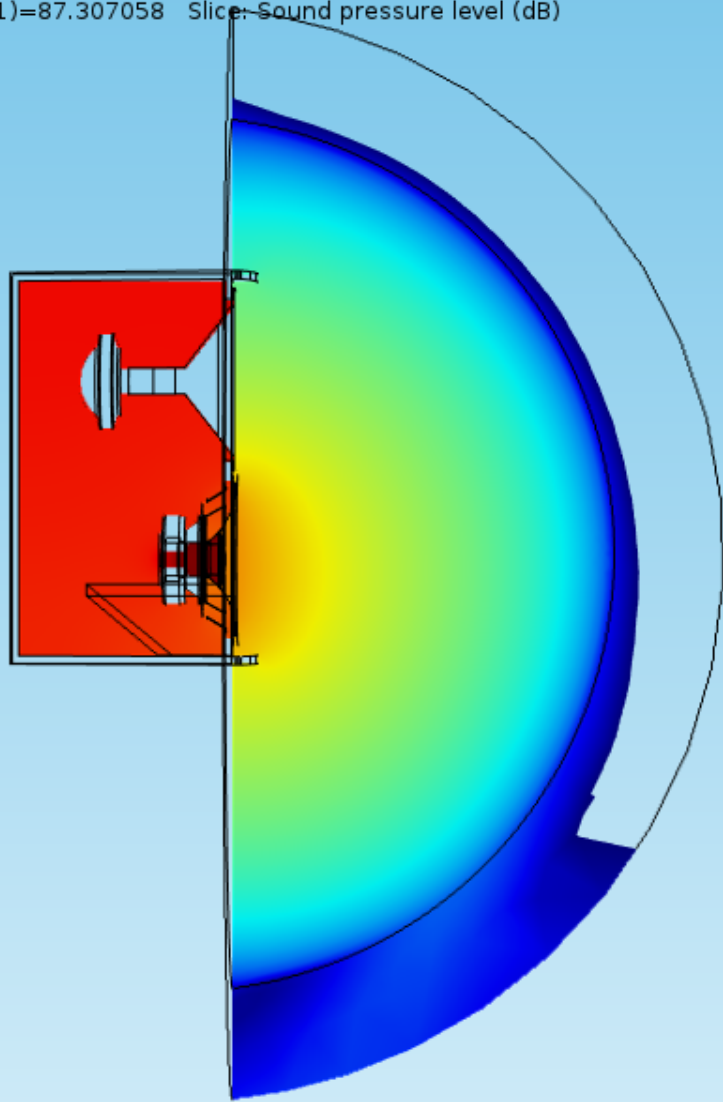
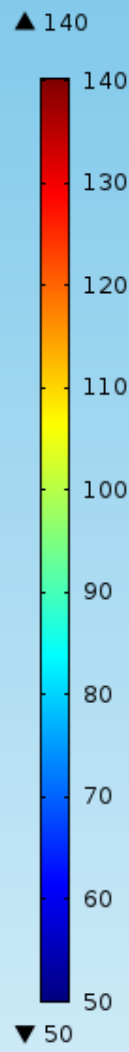
Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the two models

freq(21)=87.307058 Slice: Sound pressure level (dB)

freq(21)=87.307058 Slice: Sound pressure level (dB)



Balistreri Riccardo

Loudspeaker Design Engineer

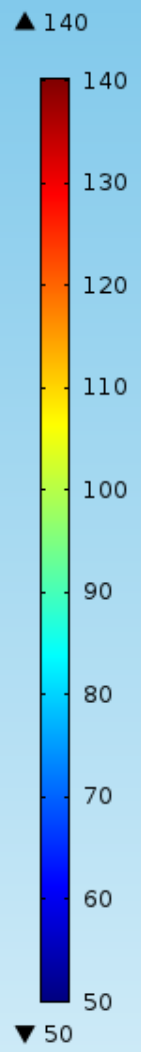
Community Professional Loudspeakers

Comparison between the two models



freq(22)=92.498606 Slice: Sound pressure level (dB)

freq(22)=92.498606 Slice: Sound pressure level (dB)



Balistreri Riccardo

Loudspeaker Design Engineer

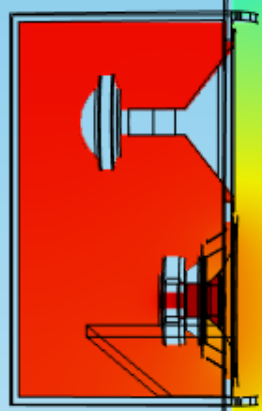
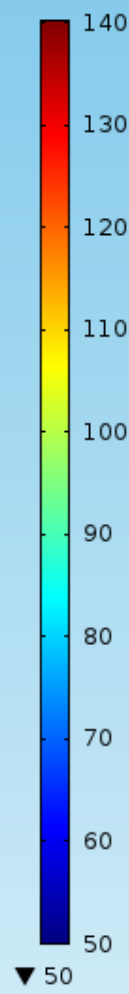
Community Professional Loudspeakers

Comparison between the two models

freq(23)=97.998859 Slice: Sound pressure level (dB)

freq(23)=97.998859 Slice: Sound pressure level (dB)

▲ 140

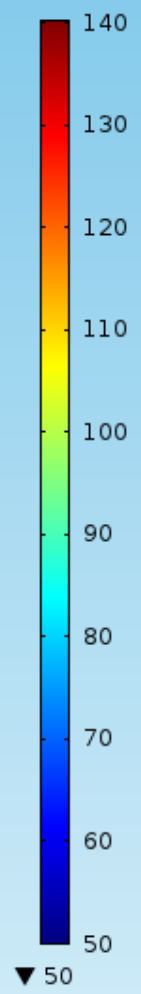


Balistreri Riccardo

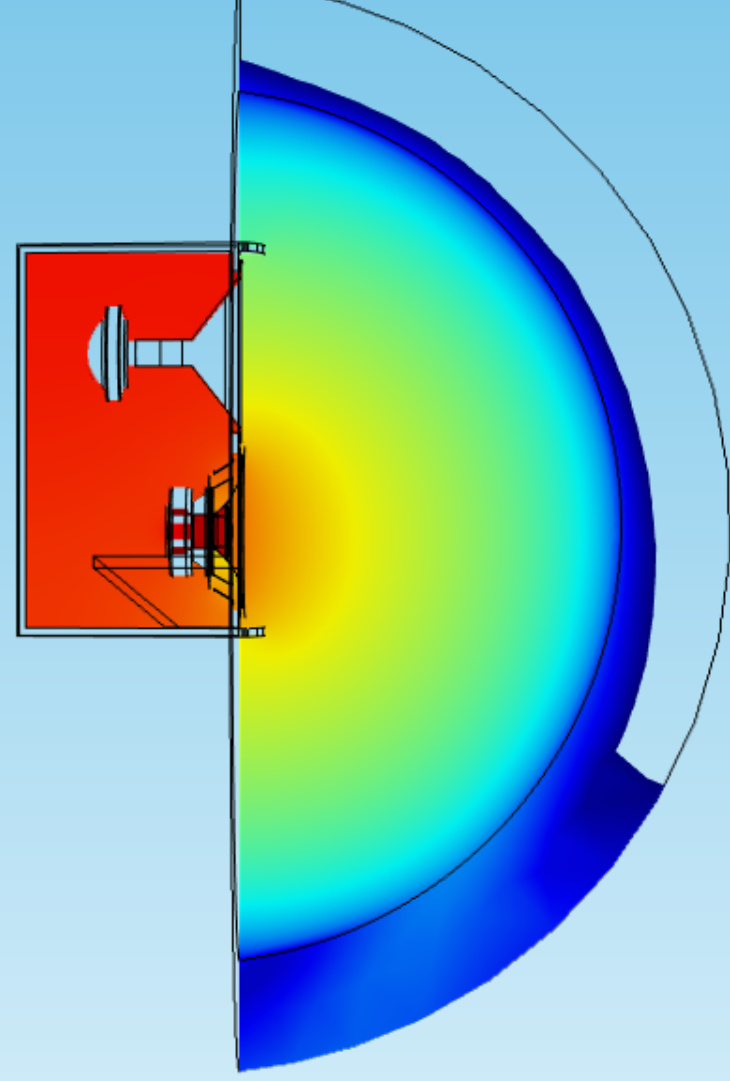
Loudspeaker Design Engineer

Community Professional Loudspeakers

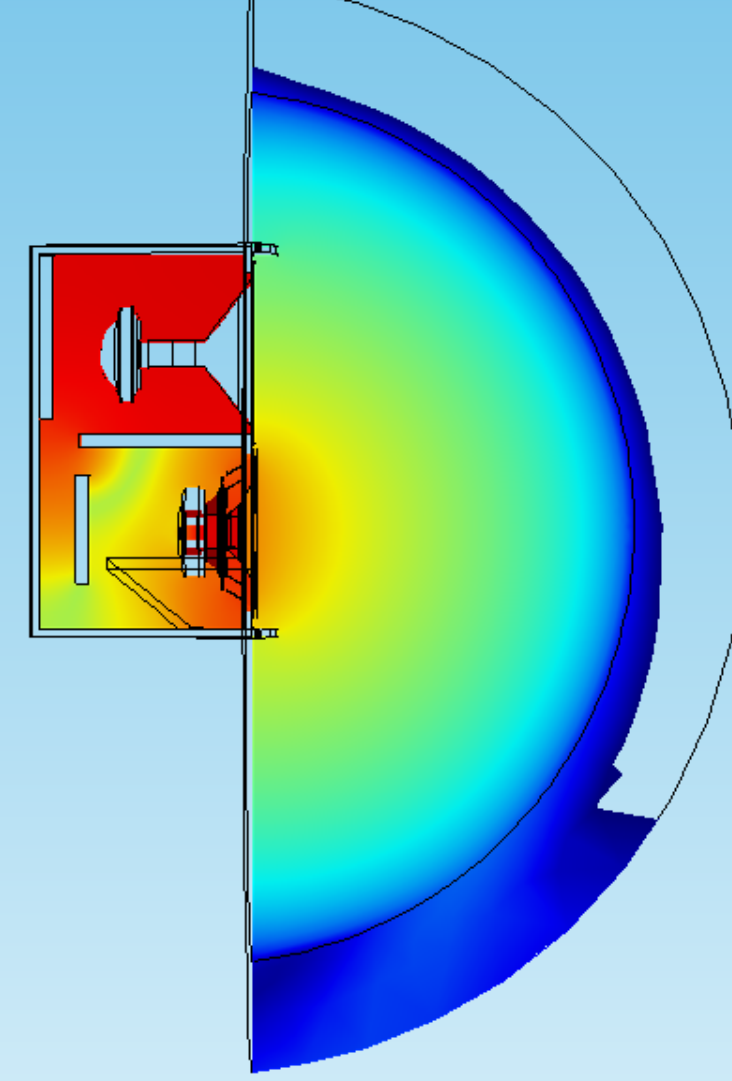
Comparison between the two models



freq(24)=103.826174 Slice: Sound pressure level (dB)



freq(24)=103.826174 Slice: Sound pressure level (dB)



Balistreri Riccardo

Loudspeaker Design Engineer

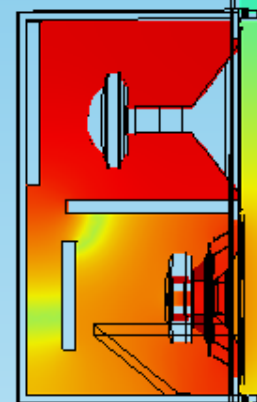
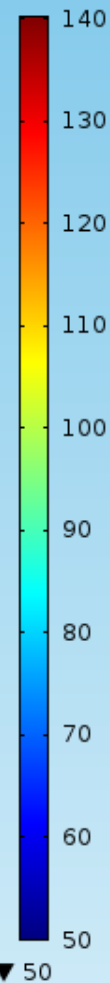
Community Professional Loudspeakers

Comparison between the two models

freq(25)=110 Slice: Sound pressure level (dB)

freq(25)=110 Slice: Sound pressure level (dB)

▲ 137

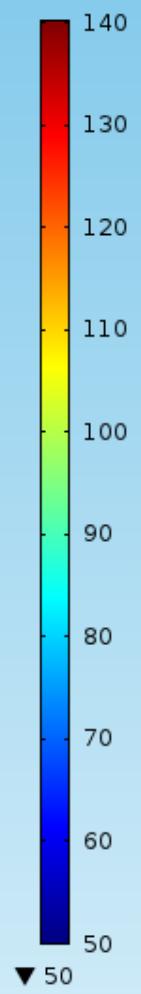


Balistreri Riccardo

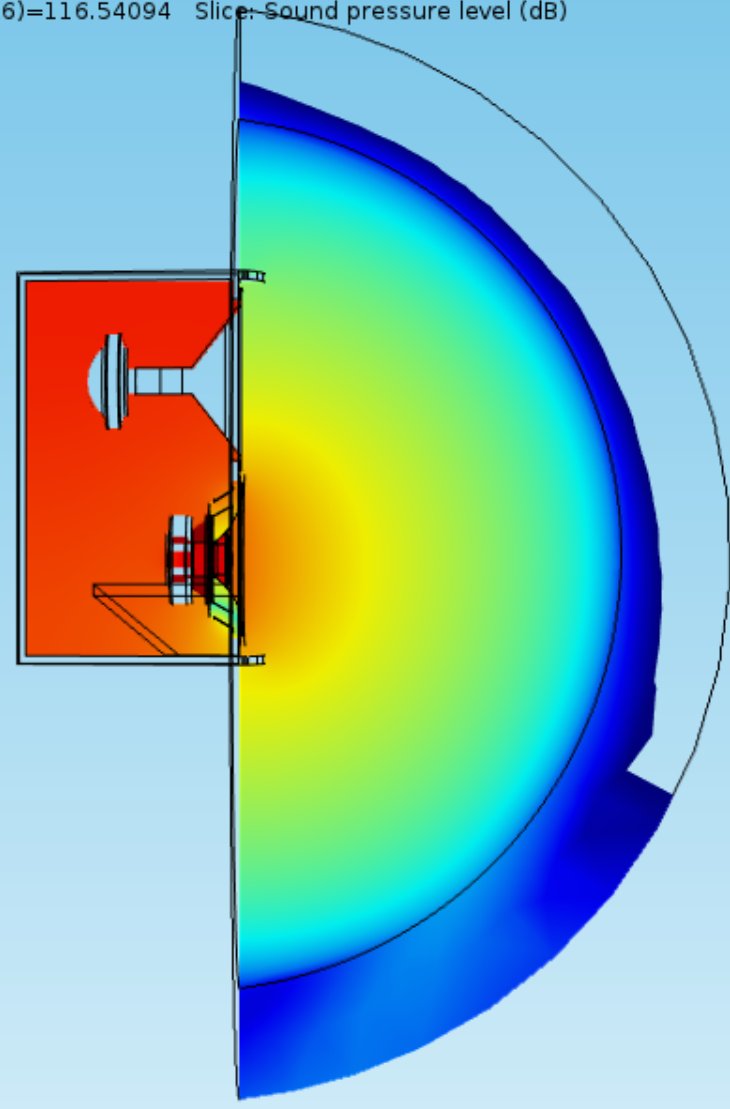
Loudspeaker Design Engineer

Community Professional Loudspeakers

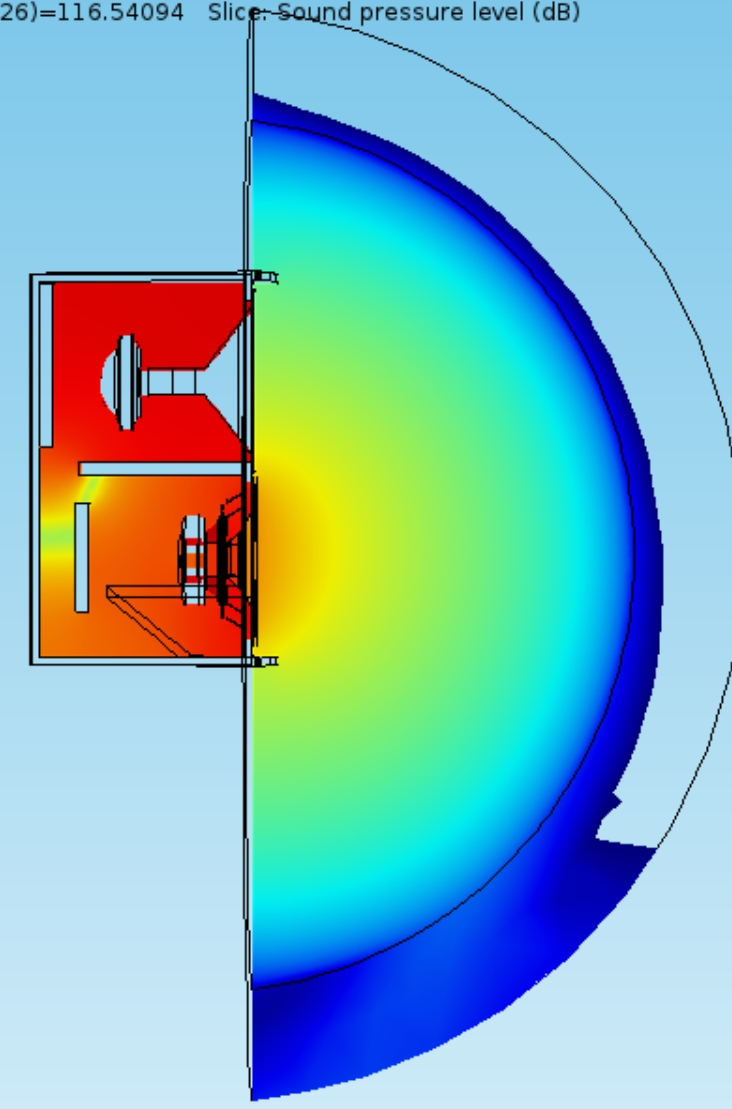
Comparison between the  
two models



freq(26)=116.54094 Slice: Sound pressure level (dB)



freq(26)=116.54094 Slice: Sound pressure level (dB)

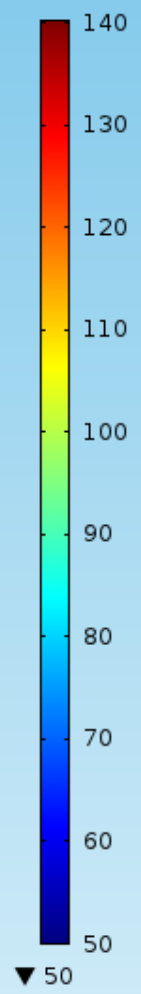


Balistreri Riccardo

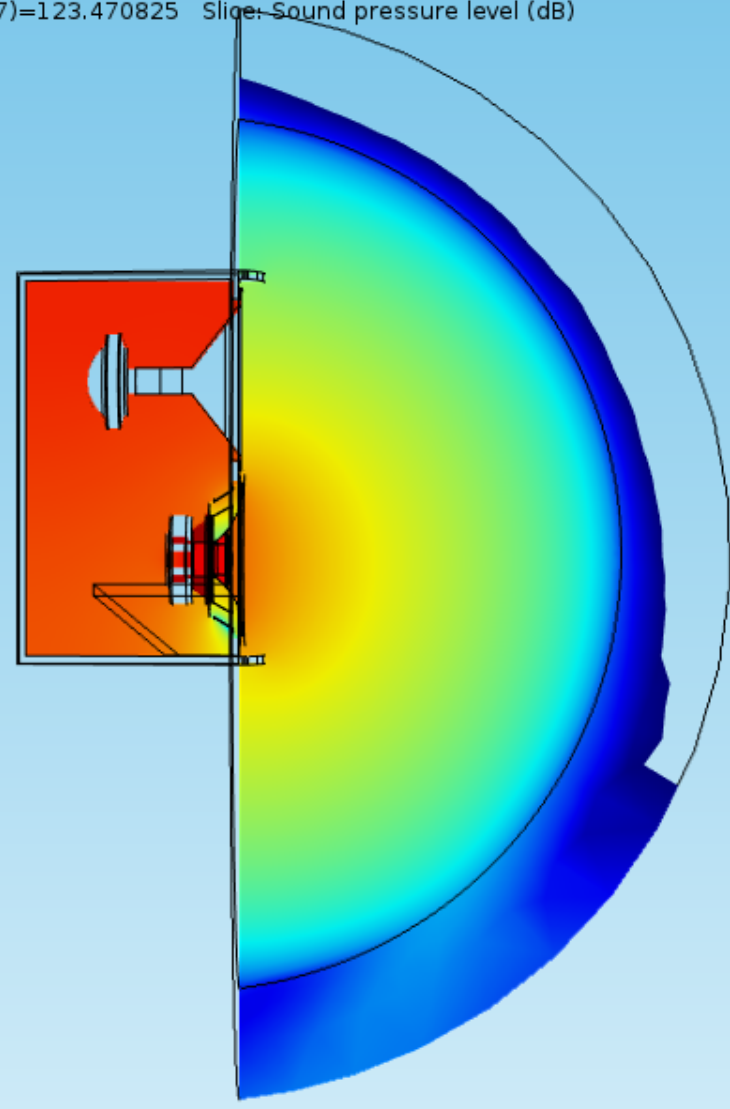
Loudspeaker Design Engineer

Community Professional Loudspeakers

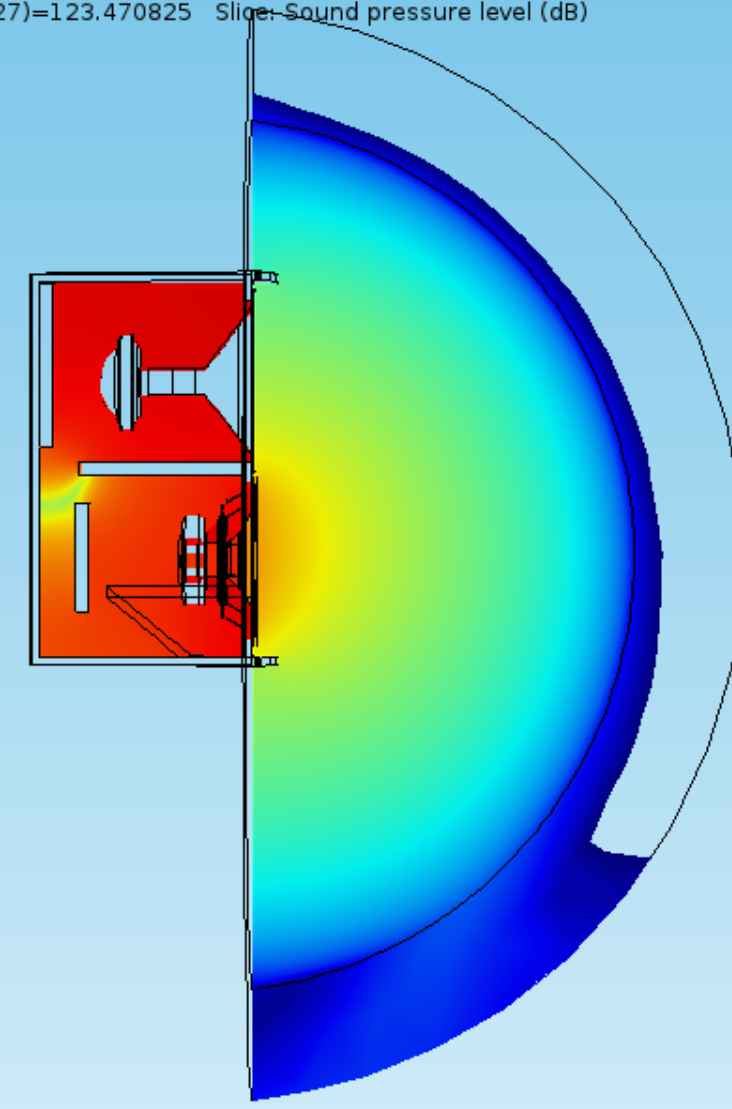
Comparison between the two models



freq(27)=123.470825 Slice: Sound pressure level (dB)



freq(27)=123.470825 Slice: Sound pressure level (dB)

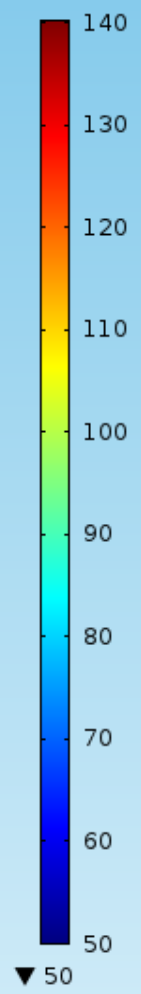


Balistreri Riccardo

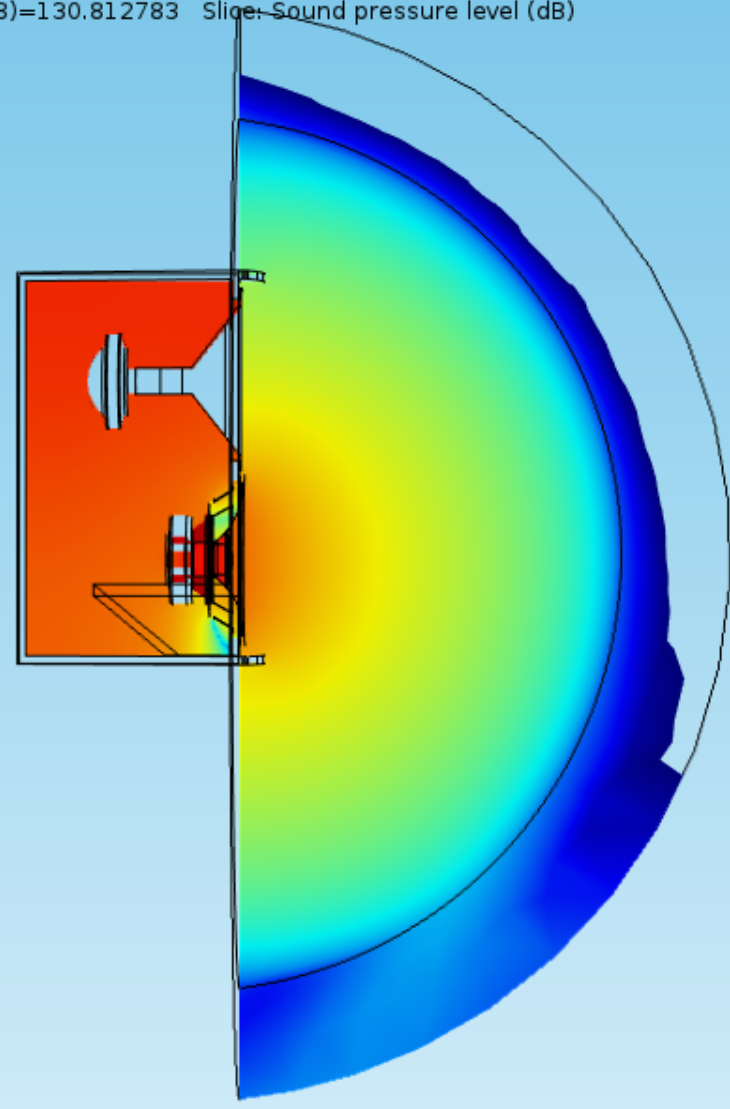
Loudspeaker Design Engineer

Community Professional Loudspeakers

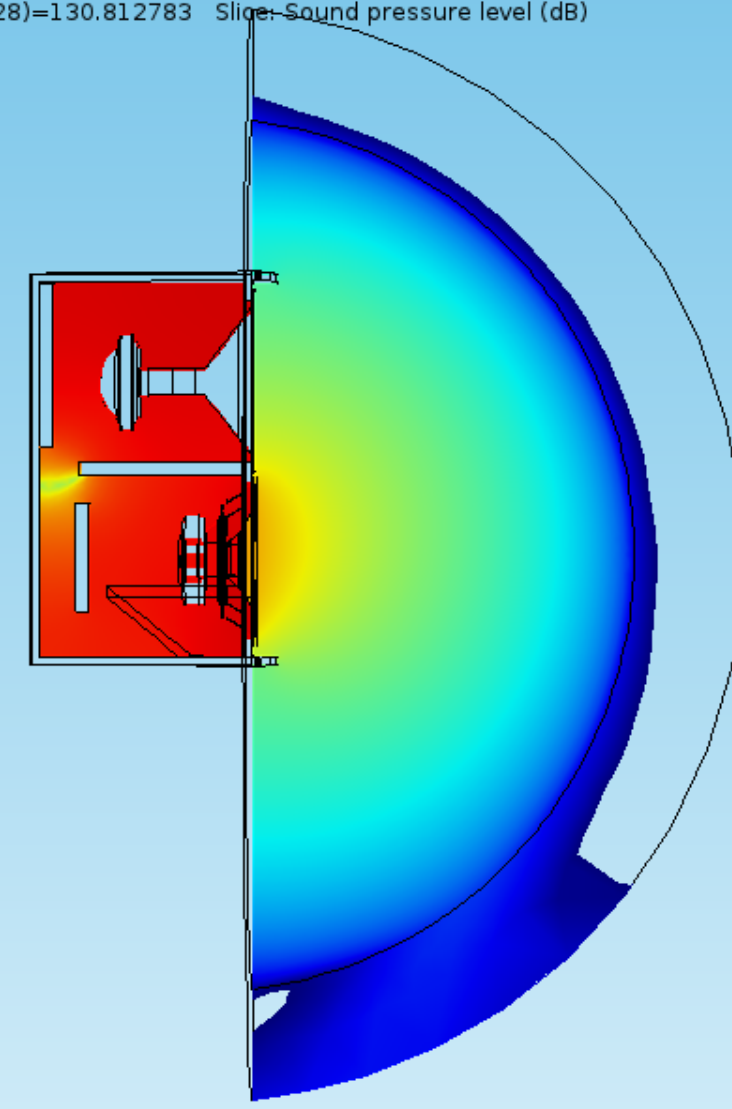
Comparison between the two models



freq(28)=130.812783 Slice: Sound pressure level (dB)



freq(28)=130.812783 Slice: Sound pressure level (dB)

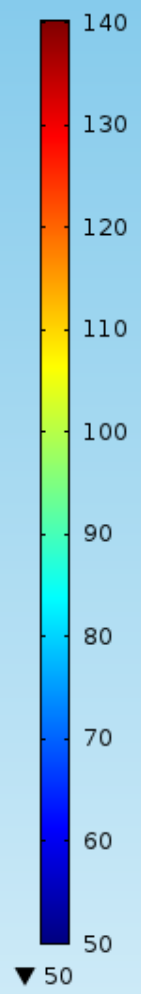


Balistreri Riccardo

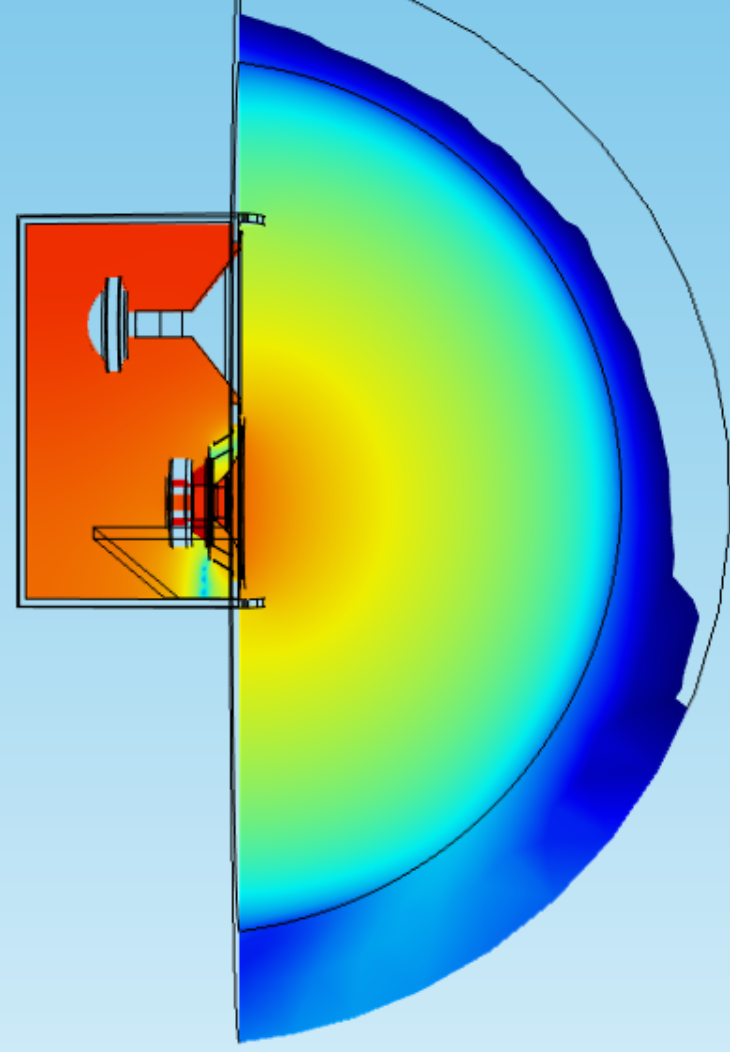
Loudspeaker Design Engineer

Community Professional Loudspeakers

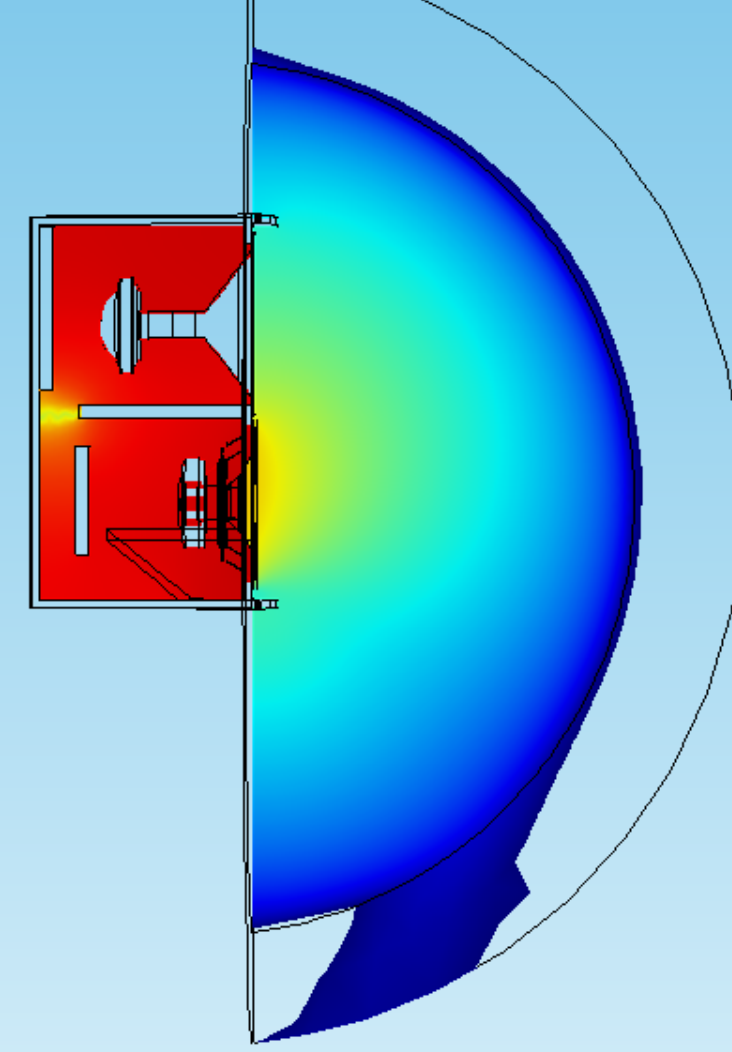
Comparison between the two models



freq(29)=138.591316 Slice: Sound pressure level (dB)



freq(29)=138.591316 Slice: Sound pressure level (dB)



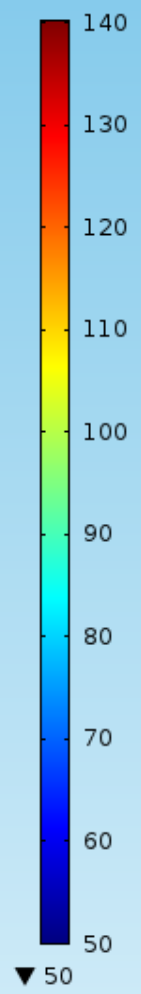
Balistreri Riccardo

Loudspeaker Design Engineer

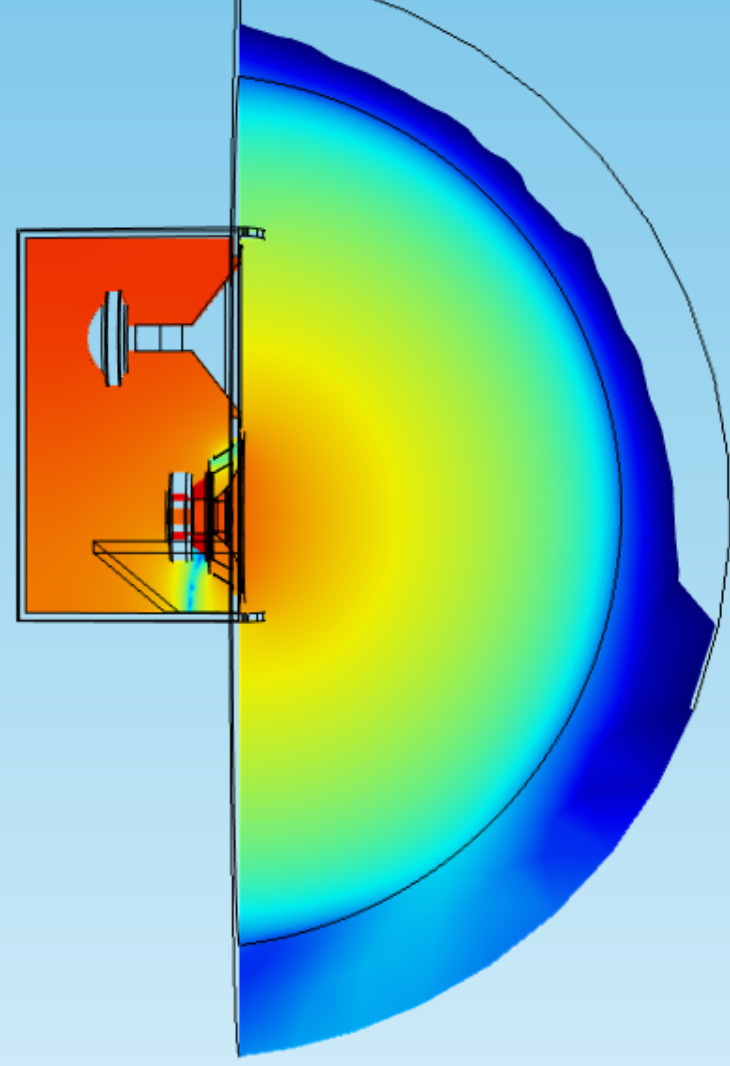
Community Professional Loudspeakers

Comparison between the two models

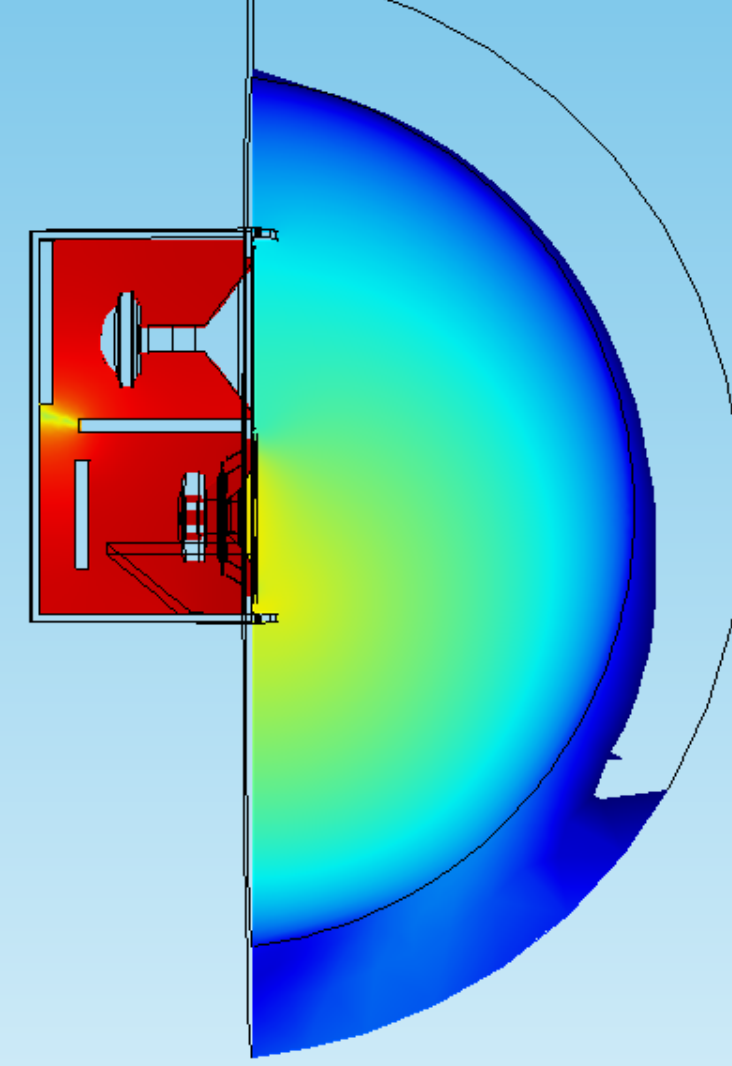




freq(30)=146.832384 Slice: Sound pressure level (dB)



freq(30)=146.832384 Slice: Sound pressure level (dB)

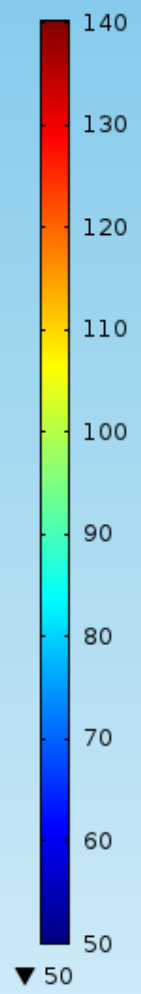


Balistreri Riccardo

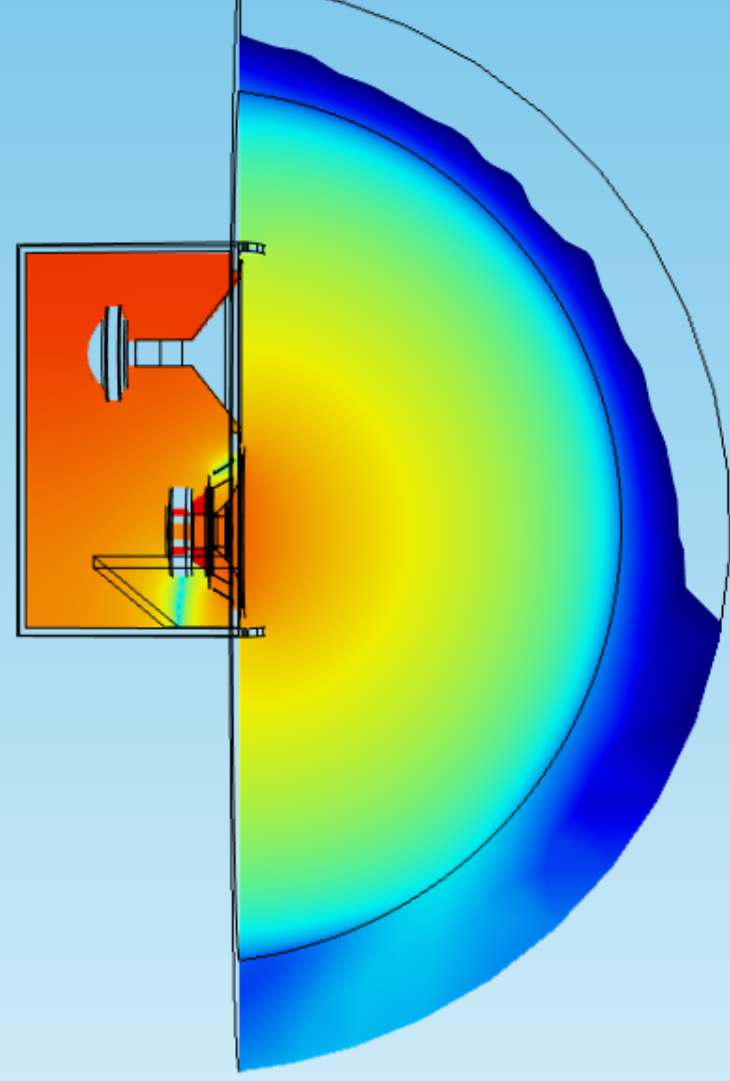
Loudspeaker Design Engineer

Community Professional Loudspeakers

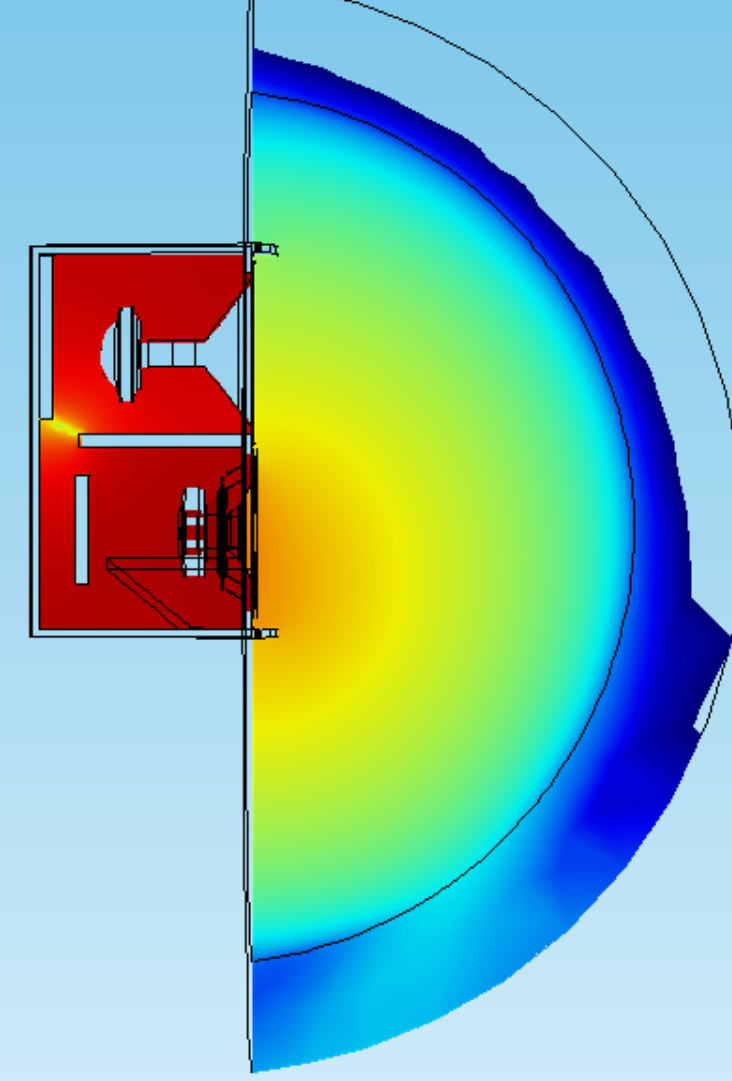
Comparison between the two models



freq(31)=155.563492 Slice: Sound pressure level (dB)



freq(31)=155.563492 Slice: Sound pressure level (dB)

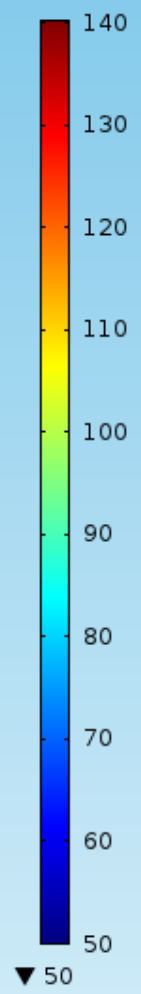


Balistreri Riccardo

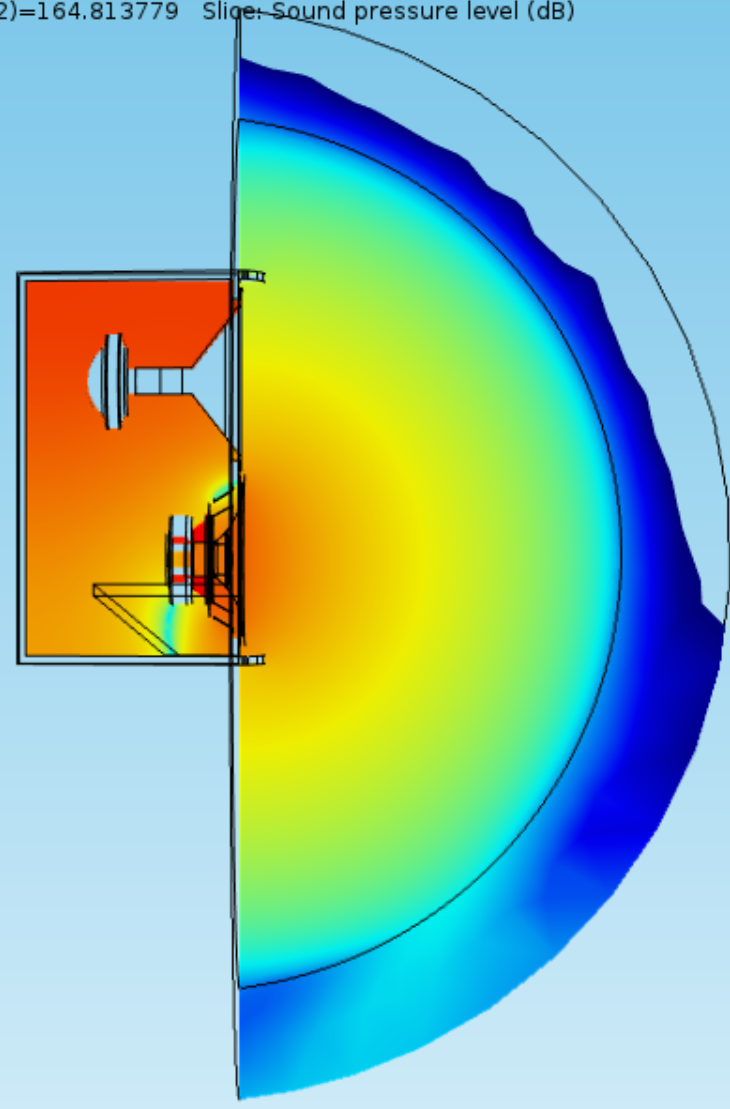
Loudspeaker Design Engineer

Community Professional Loudspeakers

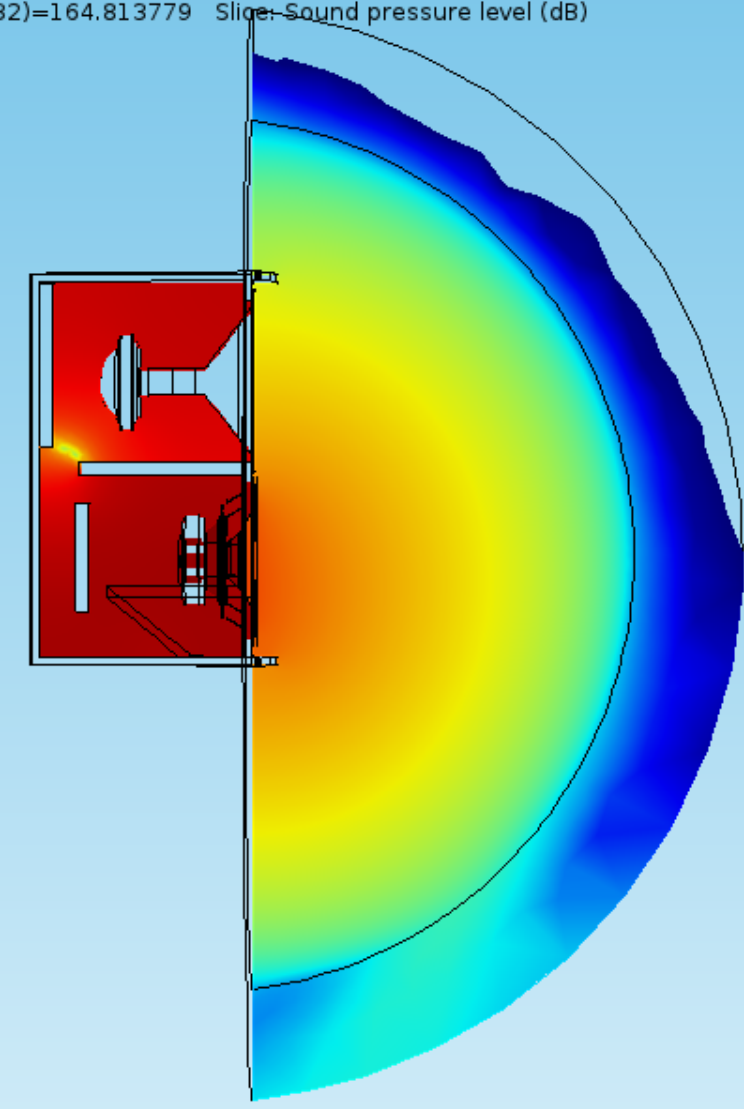
Comparison between the two models



freq(32)=164.813779 Slice: Sound pressure level (dB)



freq(32)=164.813779 Slice: Sound pressure level (dB)

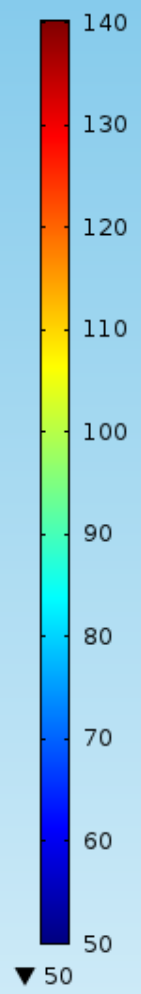


Balistreri Riccardo

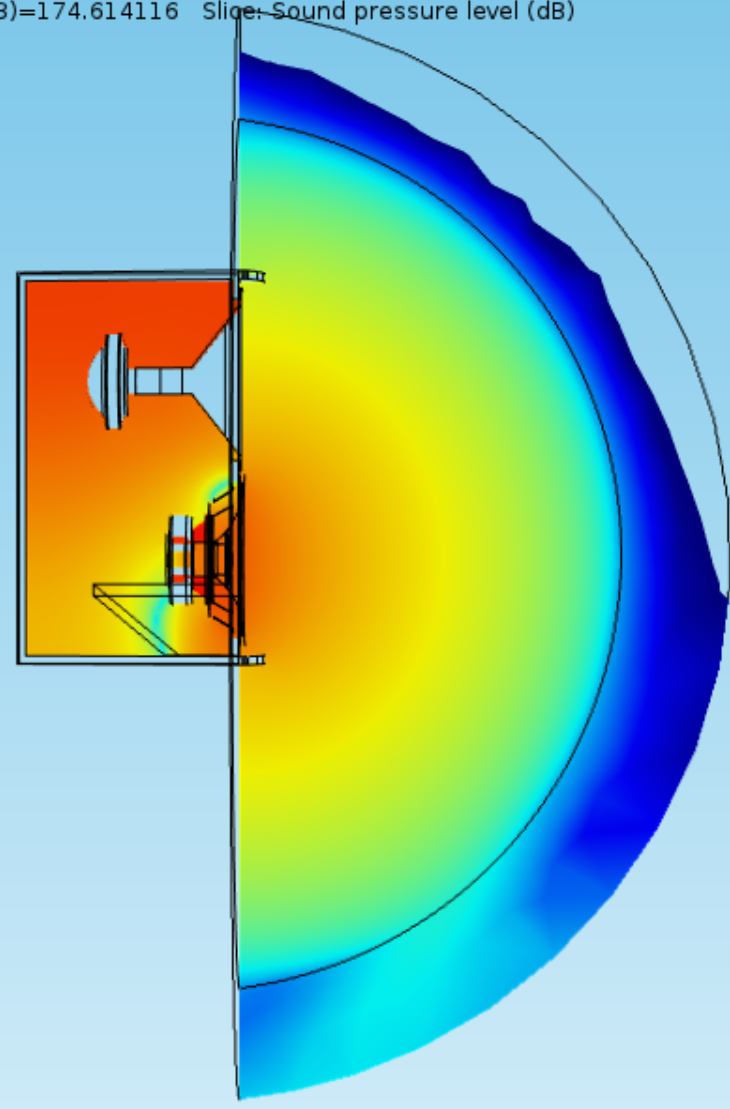
Loudspeaker Design Engineer

Community Professional Loudspeakers

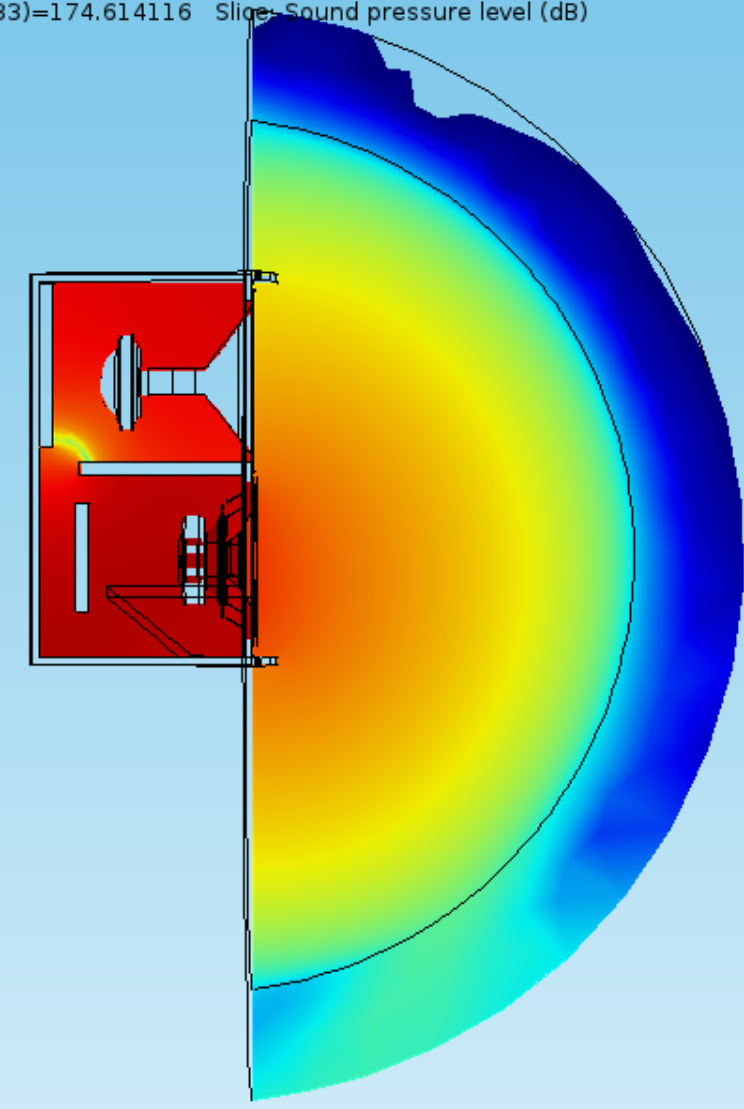
Comparison between the two models



freq(33)=174.614116 Slice: Sound pressure level (dB)



freq(33)=174.614116 Slice: Sound pressure level (dB)

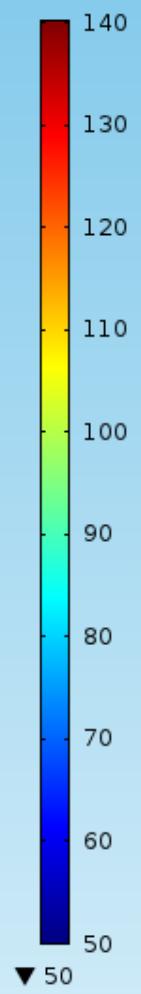


Balistreri Riccardo

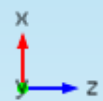
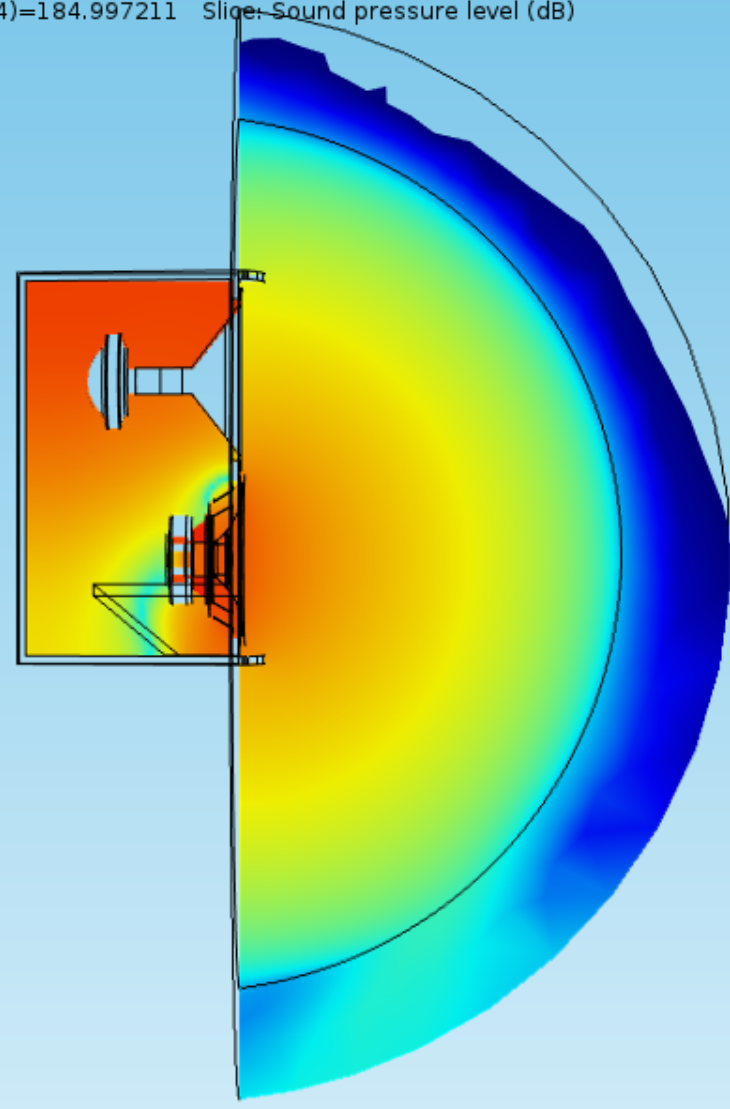
Loudspeaker Design Engineer

Community Professional Loudspeakers

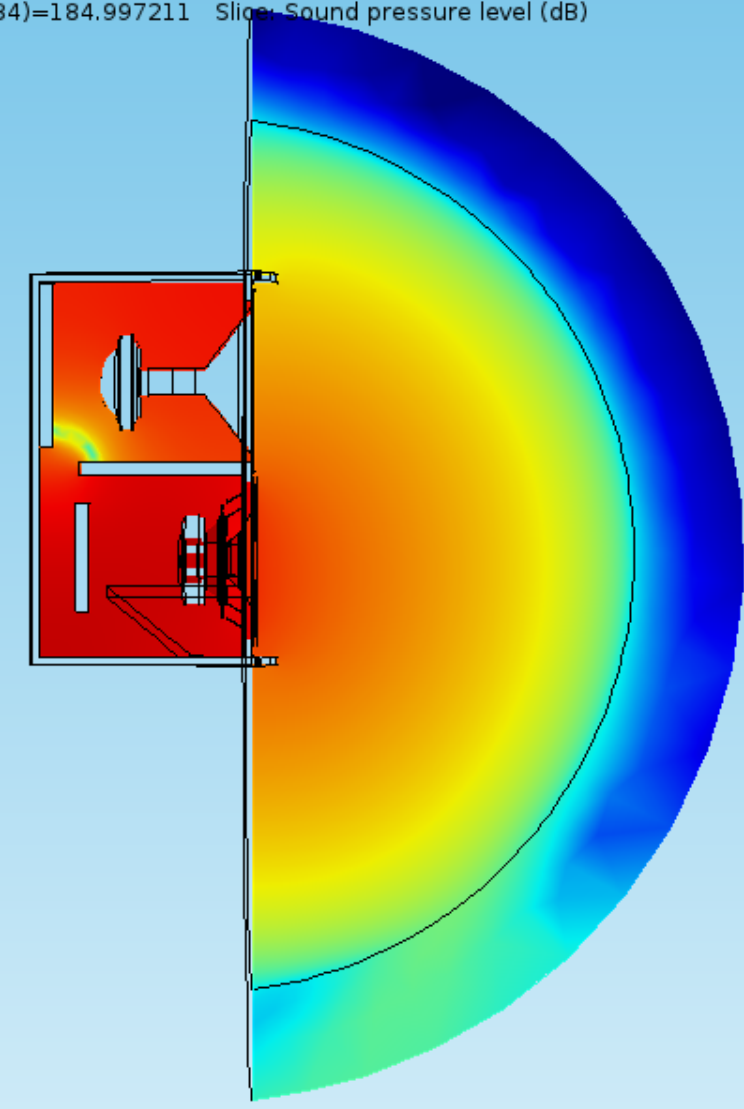
Comparison between the two models



freq(34)=184.997211 Slice: Sound pressure level (dB)



freq(34)=184.997211 Slice: Sound pressure level (dB)



Comparison between the two models

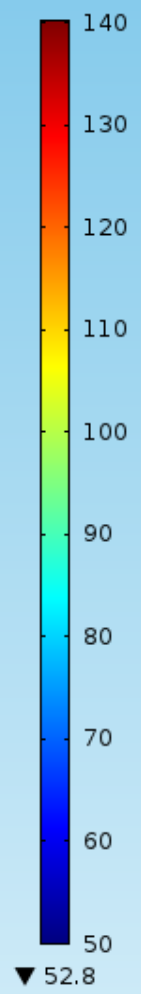
Balistreri Riccardo  
Loudspeaker Design Engineer

Community Professional Loudspeakers

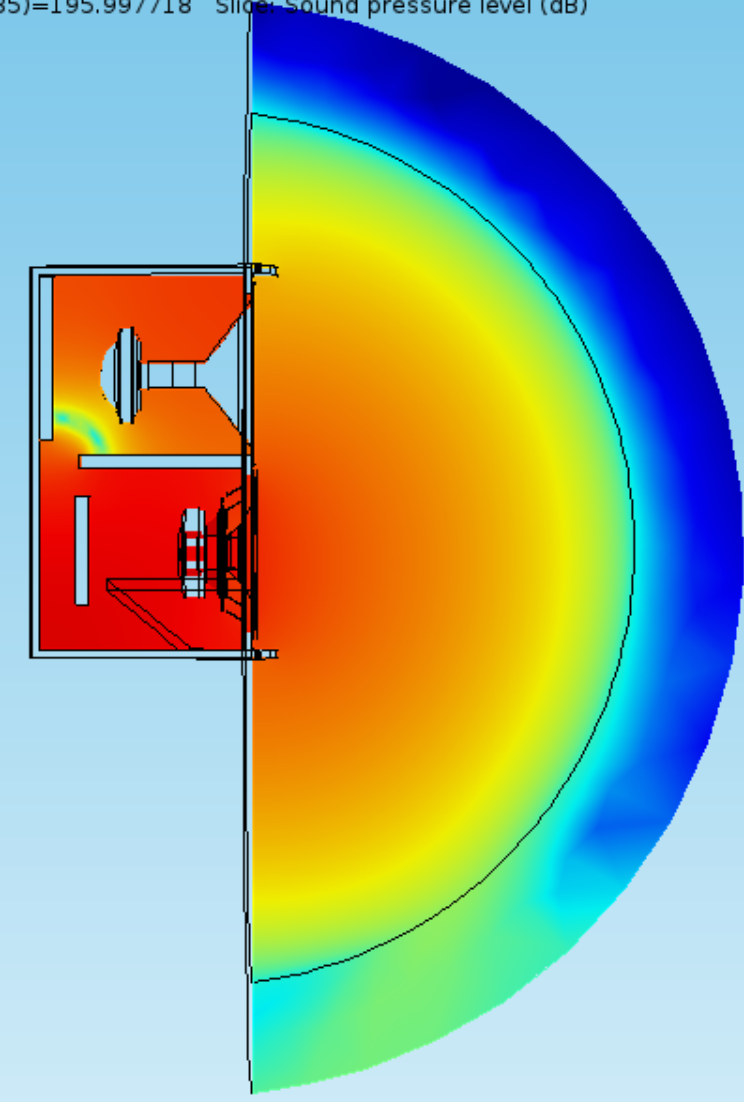
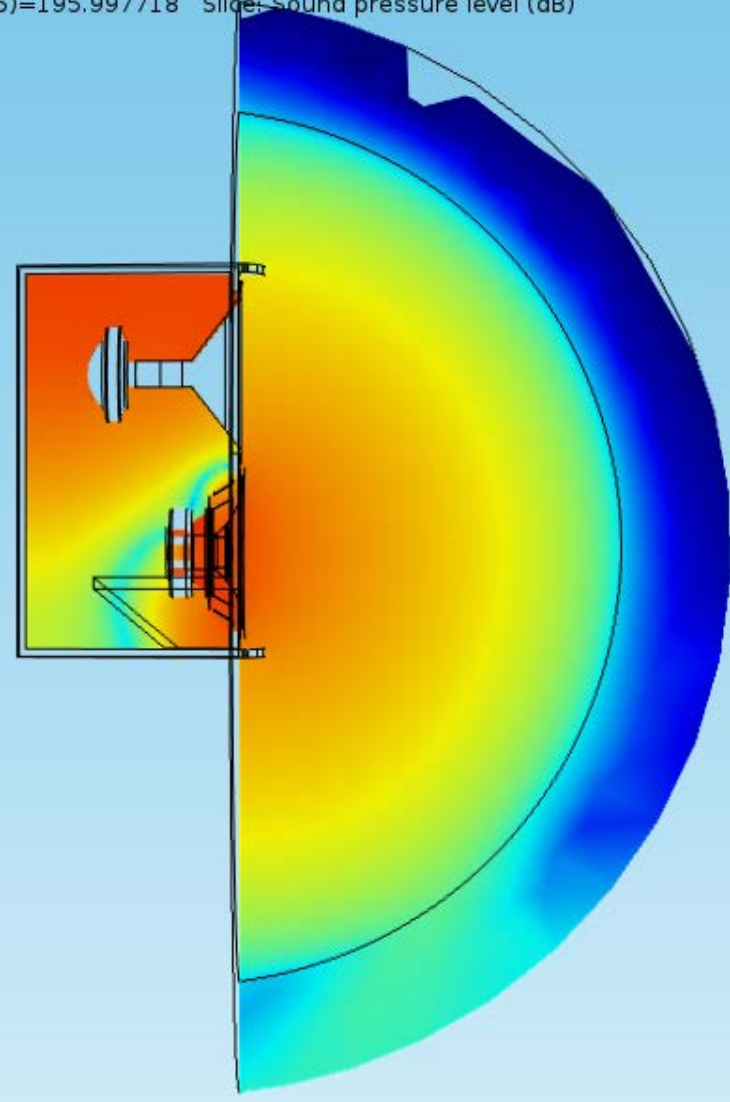
freq(35)=195.997718 Slice: Sound pressure level (dB)

freq(35)=195.997718 Slice: Sound pressure level (dB)

▲ 132



▼ 52.8

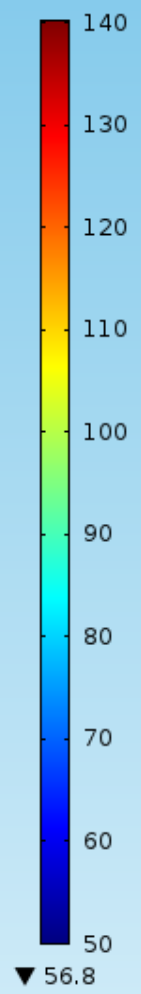


Balistreri Riccardo

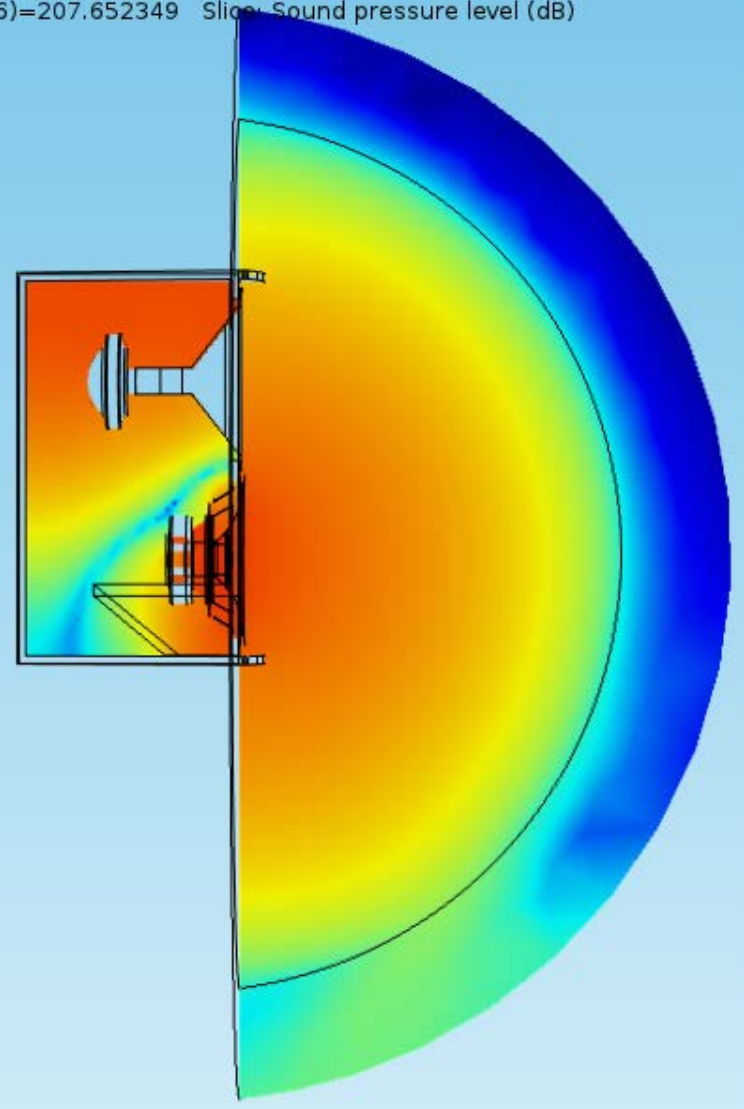
Loudspeaker Design Engineer

Community Professional Loudspeakers

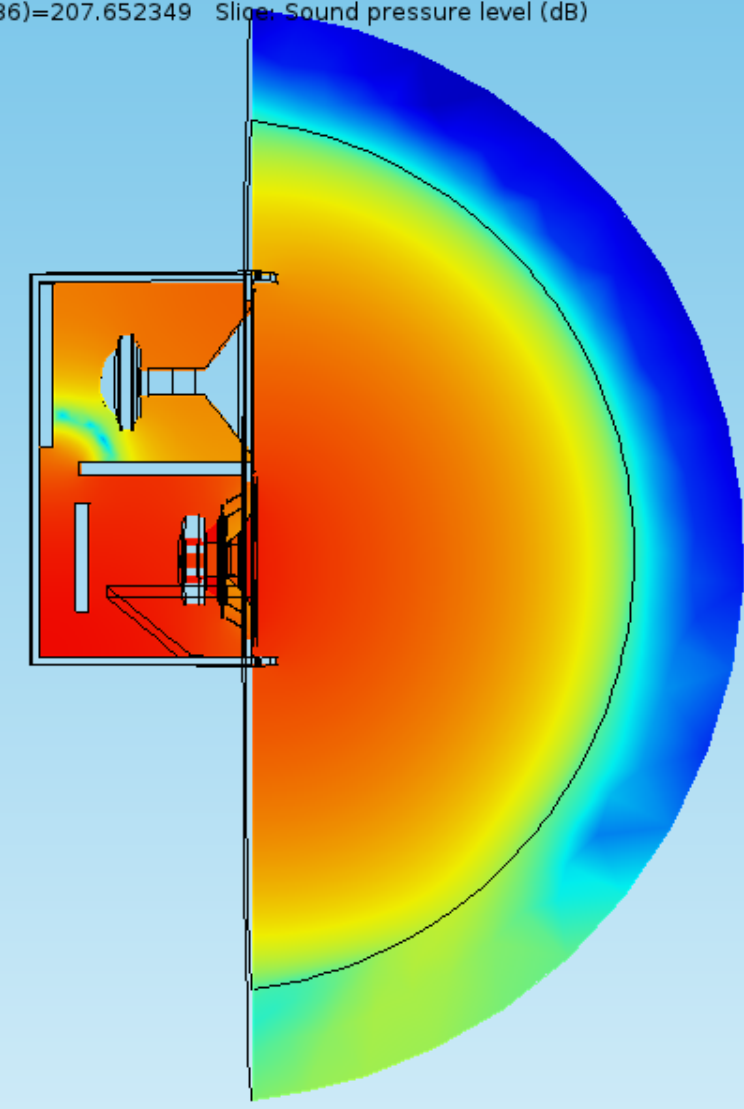
Comparison between the two models



freq(36)=207.652349 Slice: Sound pressure level (dB)



freq(36)=207.652349 Slice: Sound pressure level (dB)



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the two models



freq(37)=220 Slice: Sound pressure level (dB)

freq(37)=220 Slice: Sound pressure level (dB)

▲ 129

140

130

120

110

100

90

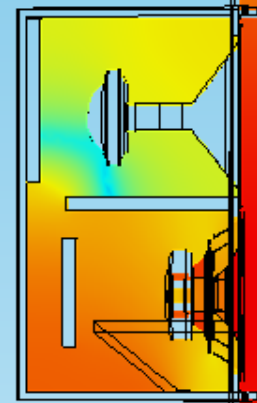
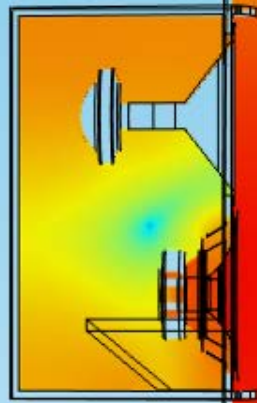
80

70

60

50

▼ 63.5



Balistreri Riccardo

Loudspeaker Design Engineer

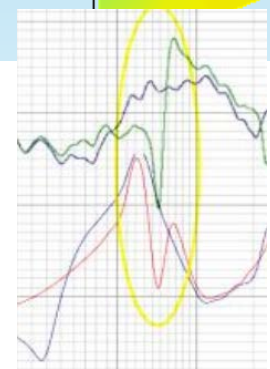
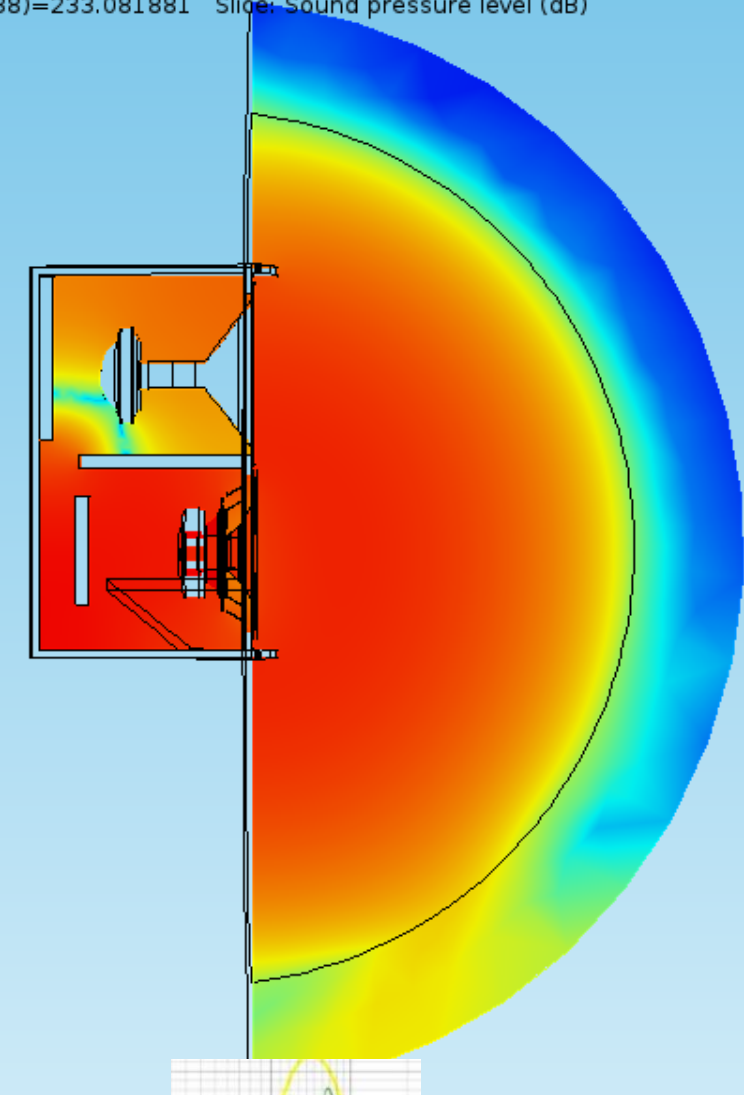
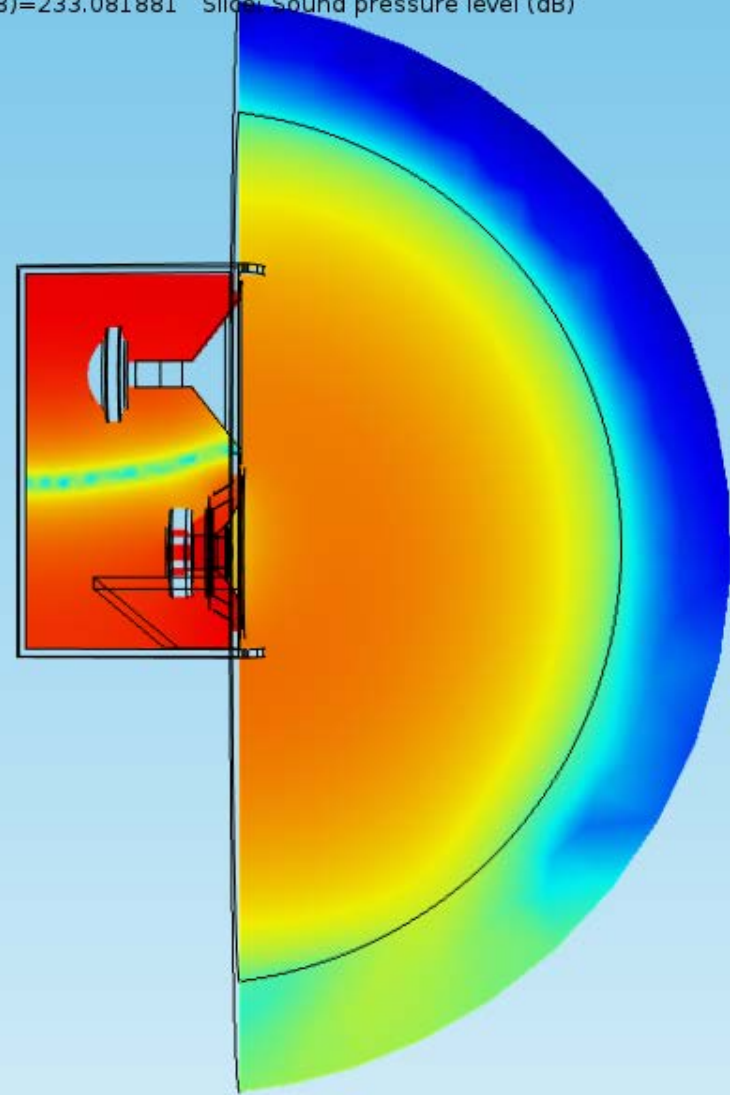
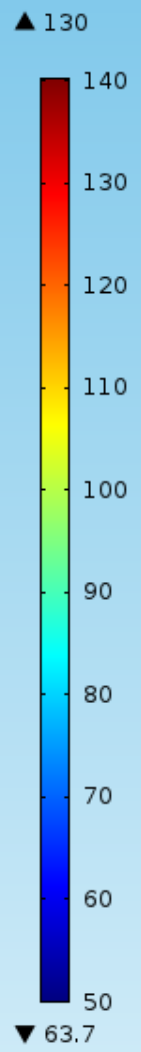
Community Professional Loudspeakers

Comparison between the  
two models



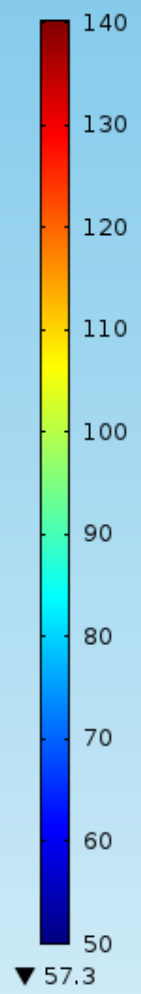
freq(38)=233.081881 Slice: Sound pressure level (dB)

freq(38)=233.081881 Slice: Sound pressure level (dB)

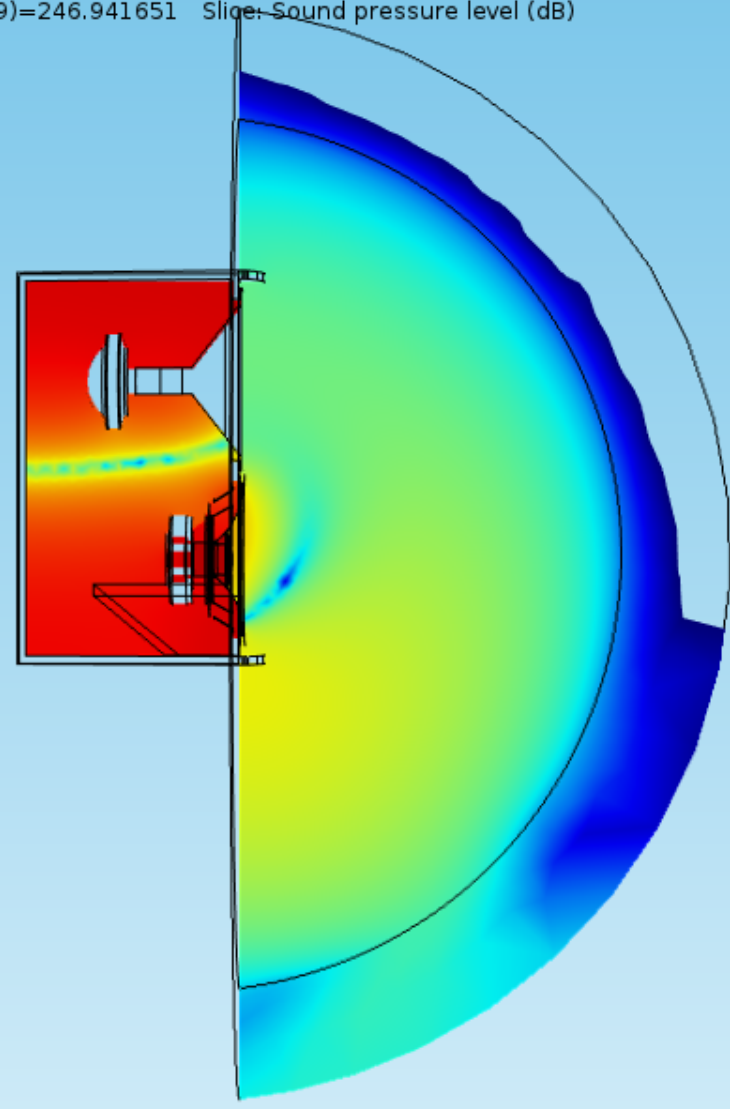


Comparison between the two models

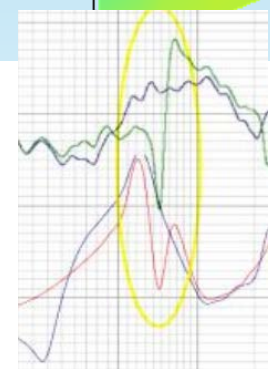
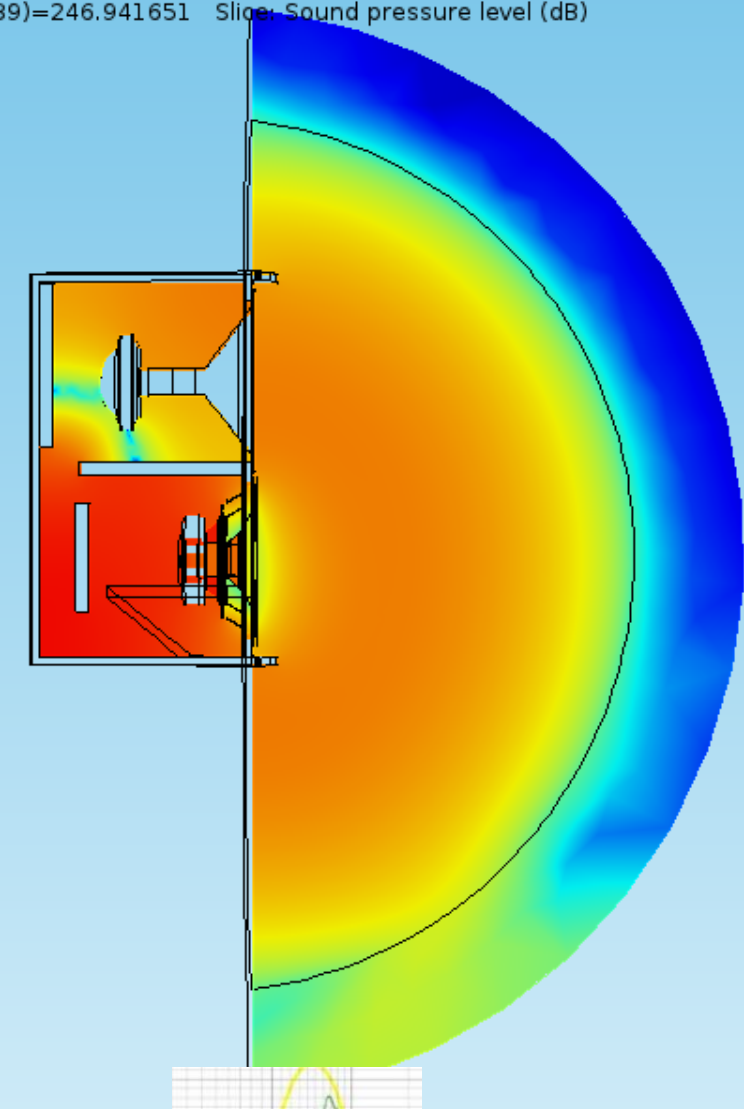
Balistreri Riccardo  
Loudspeaker Design Engineer  
Community Professional Loudspeakers



freq(39)=246.941651 Slice: Sound pressure level (dB)

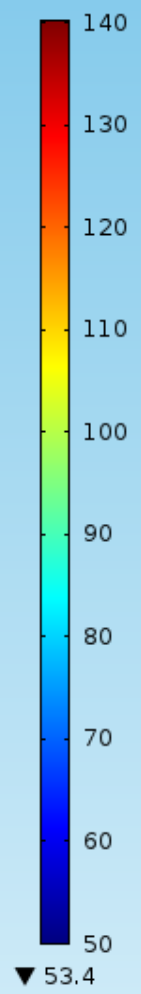


freq(39)=246.941651 Slice: Sound pressure level (dB)

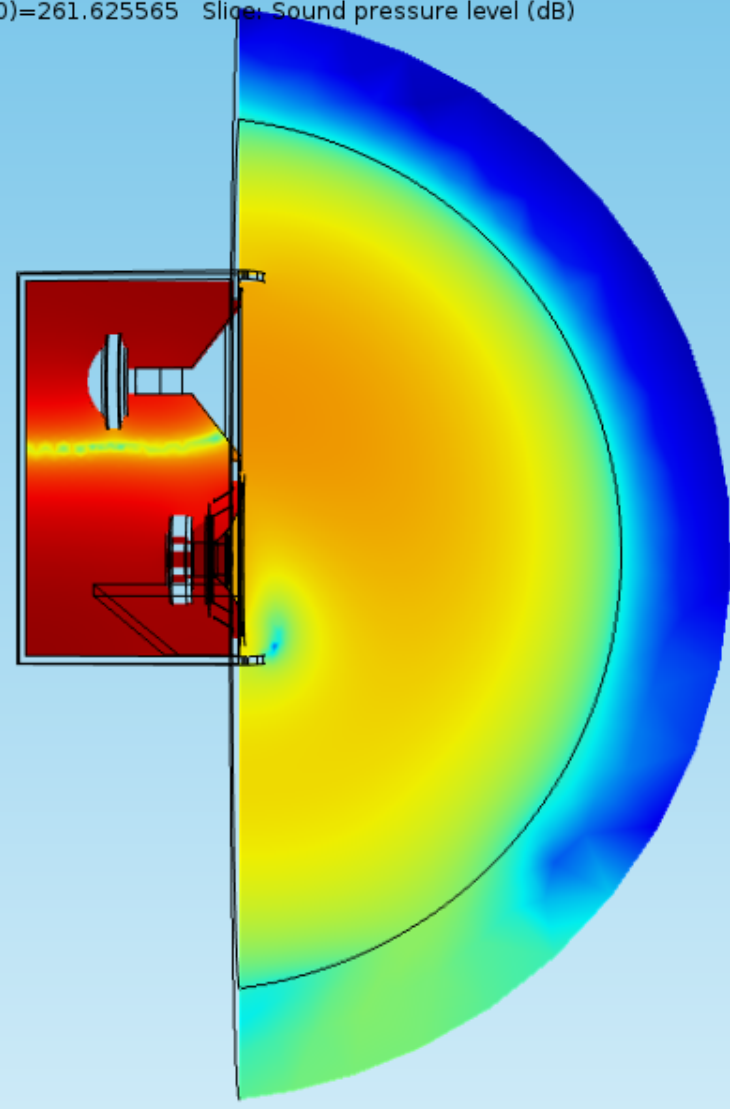


Comparison between the two models

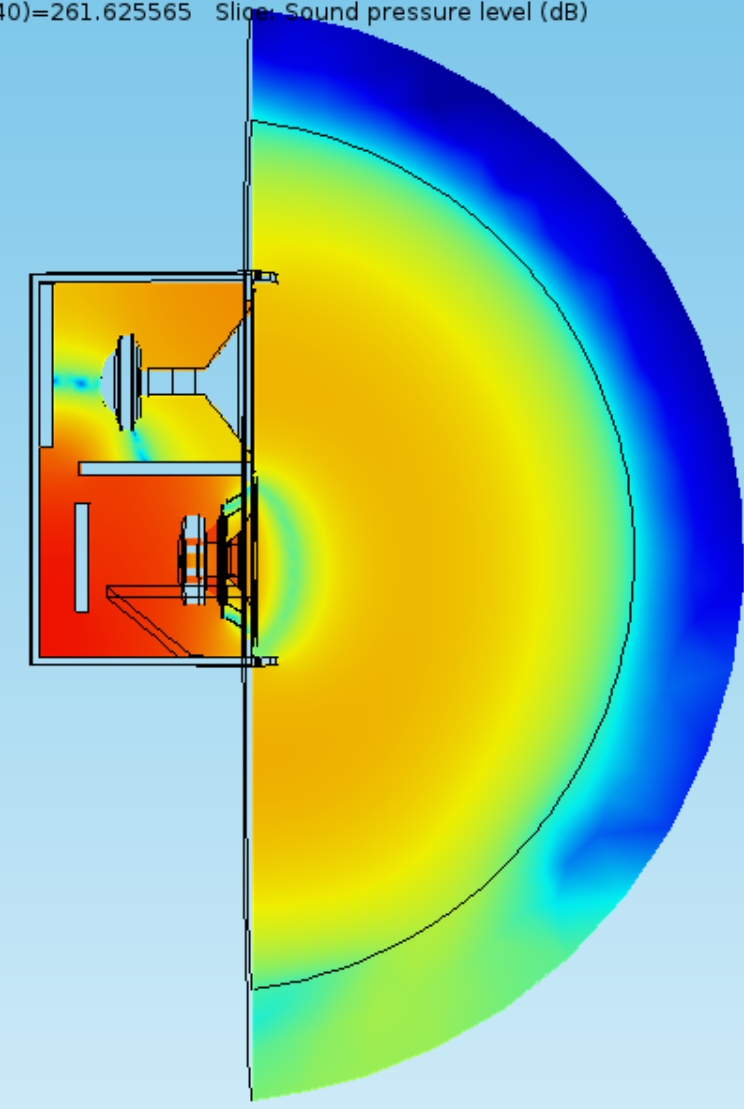
Balistreri Riccardo  
Loudspeaker Design Engineer  
Community Professional Loudspeakers



freq(40)=261.625565 Slice: Sound pressure level (dB)



freq(40)=261.625565 Slice: Sound pressure level (dB)

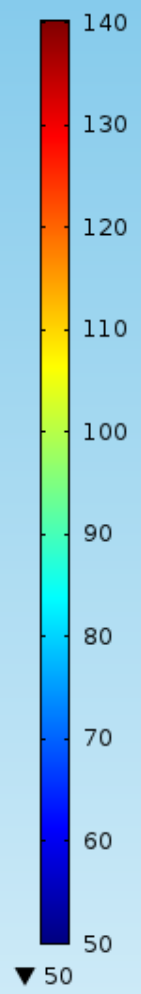


Balistreri Riccardo

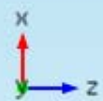
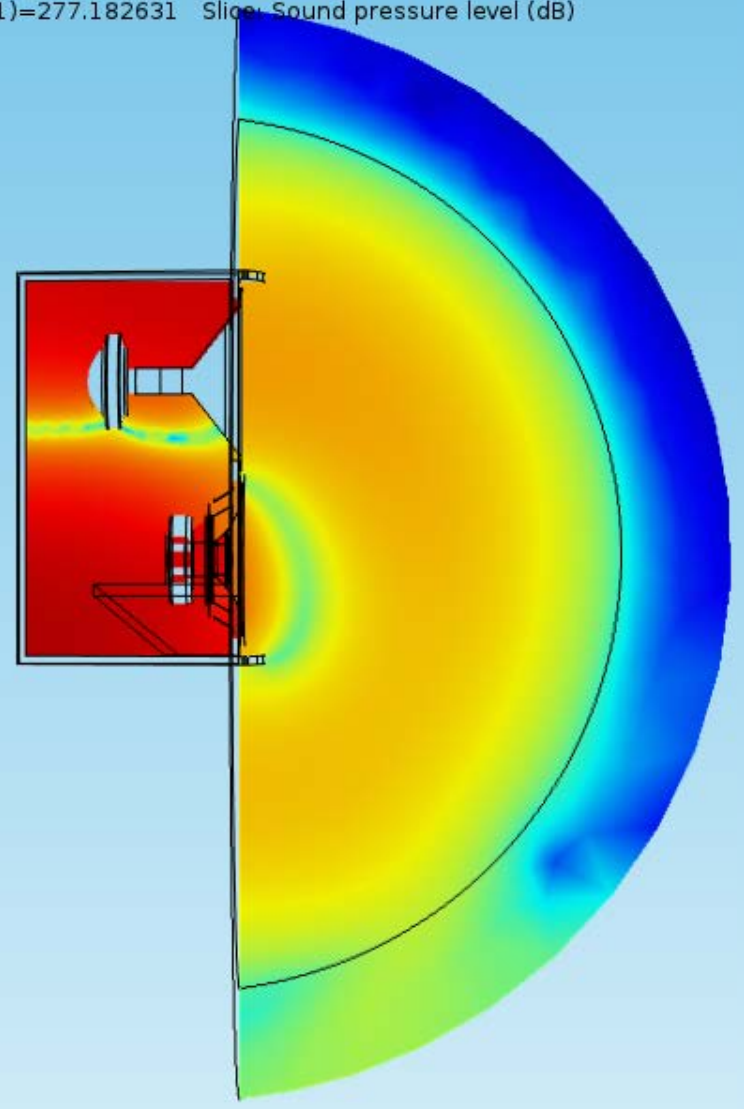
Loudspeaker Design Engineer

Community Professional Loudspeakers

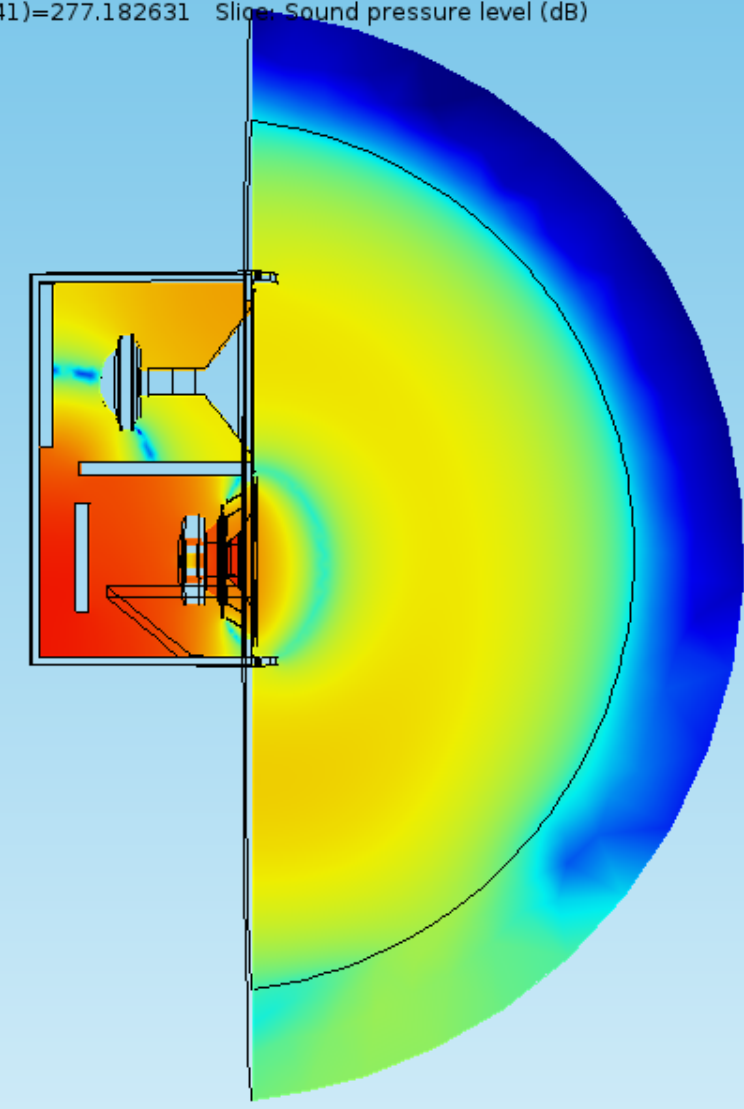
Comparison between the two models



freq(41)=277.182631 Slice: Sound pressure level (dB)



freq(41)=277.182631 Slice: Sound pressure level (dB)

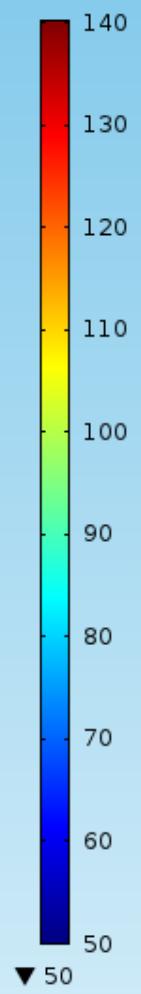


Balistreri Riccardo

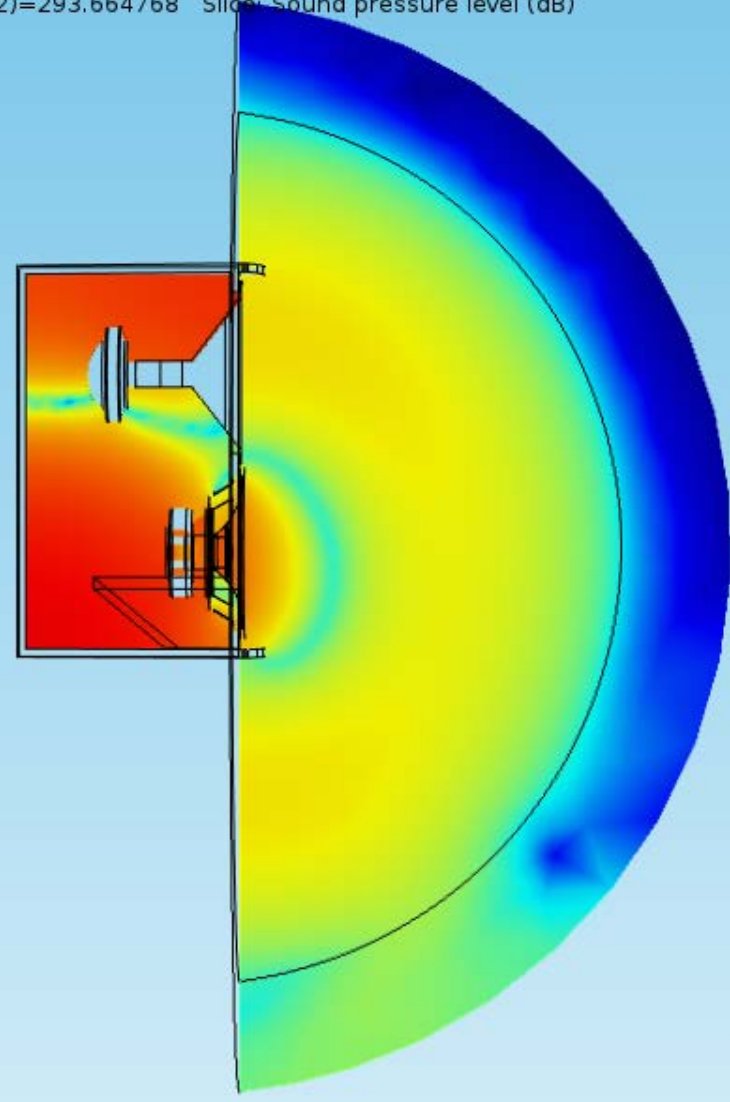
Loudspeaker Design Engineer

Community Professional Loudspeakers

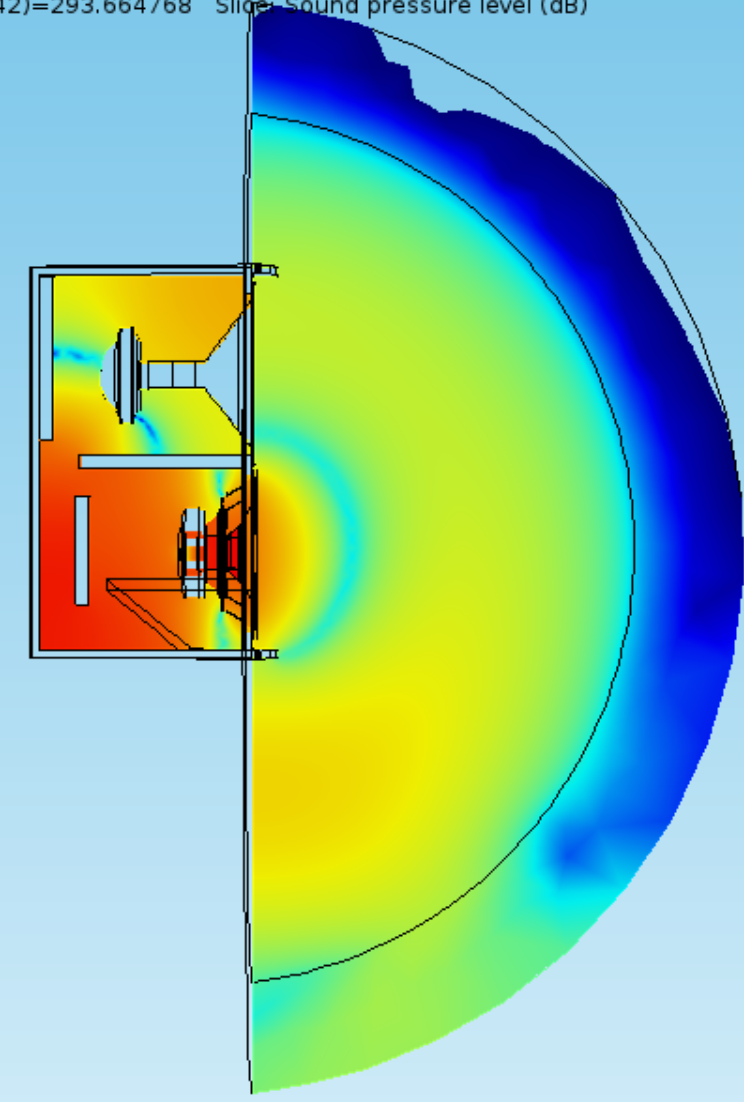
Comparison between the two models



freq(42)=293.664768 Slice: Sound pressure level (dB)



freq(42)=293.664768 Slice: Sound pressure level (dB)



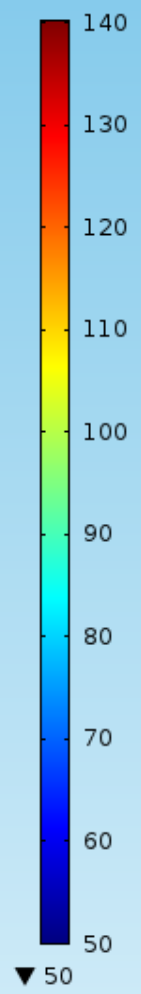
Balistreri Riccardo

Loudspeaker Design Engineer

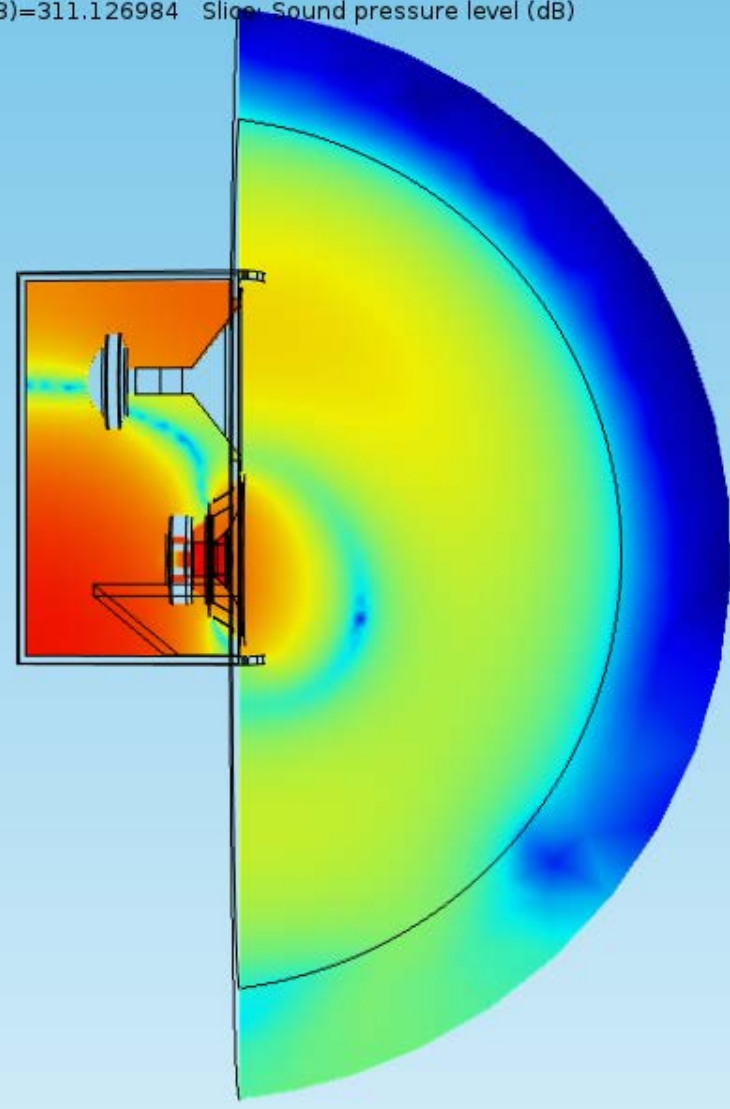
Community Professional Loudspeakers

Comparison between the two models

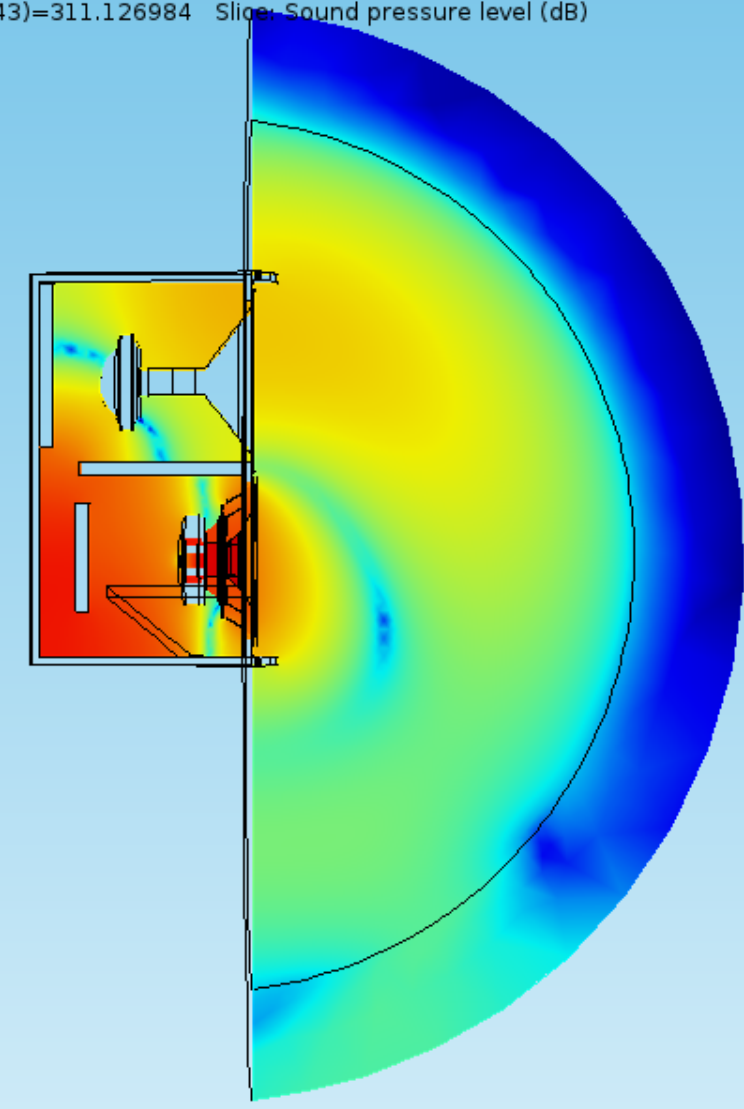




freq(43)=311.126984 Slice: Sound pressure level (dB)



freq(43)=311.126984 Slice: Sound pressure level (dB)

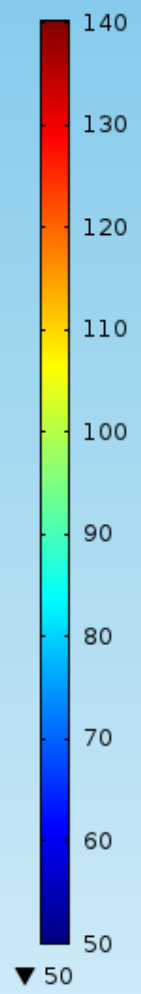


Balistreri Riccardo

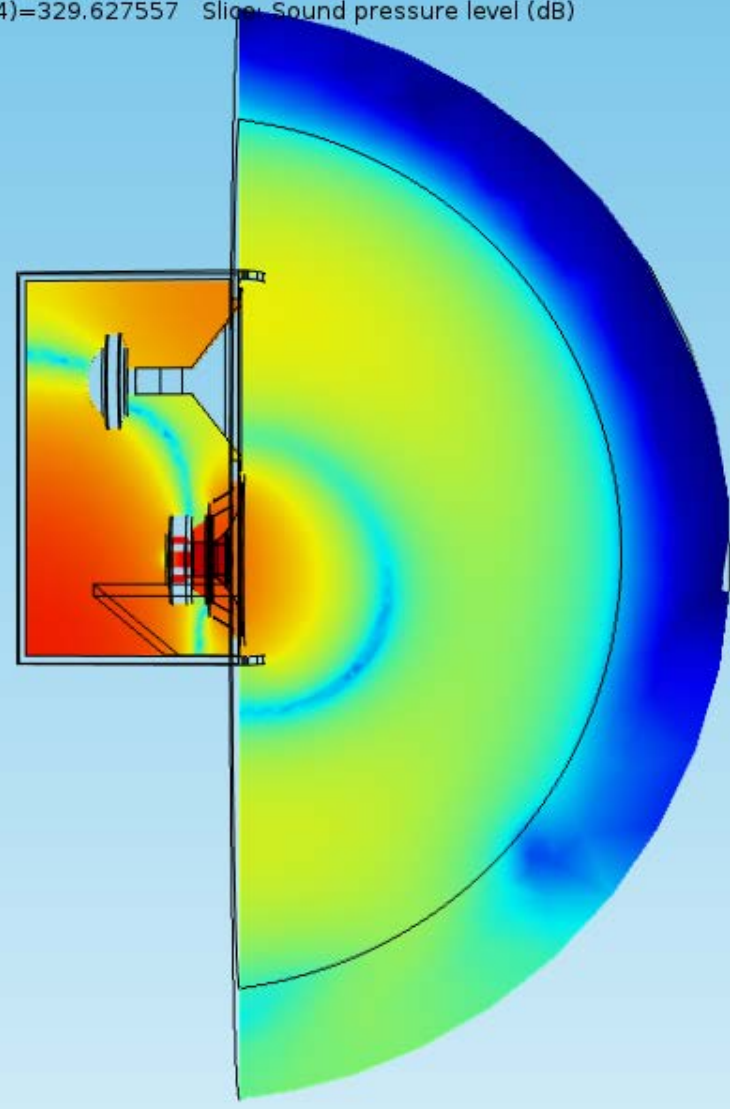
Loudspeaker Design Engineer

Community Professional Loudspeakers

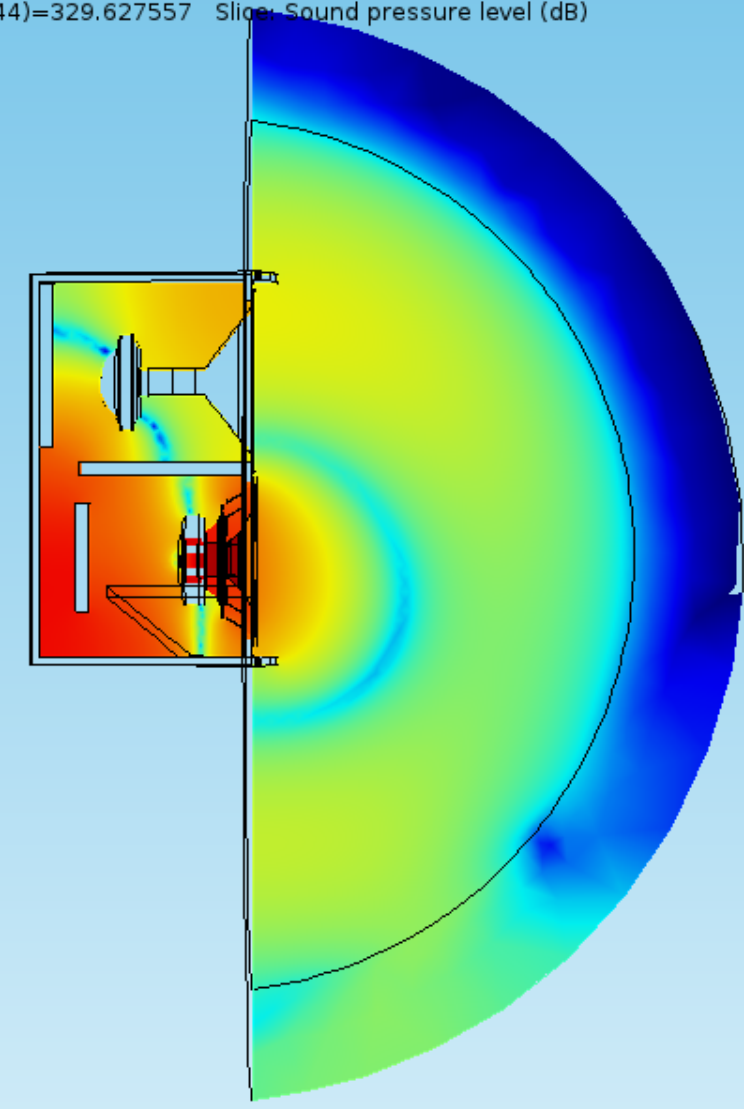
Comparison between the two models



freq(44)=329.627557 Slice: Sound pressure level (dB)



freq(44)=329.627557 Slice: Sound pressure level (dB)



Balistreri Riccardo

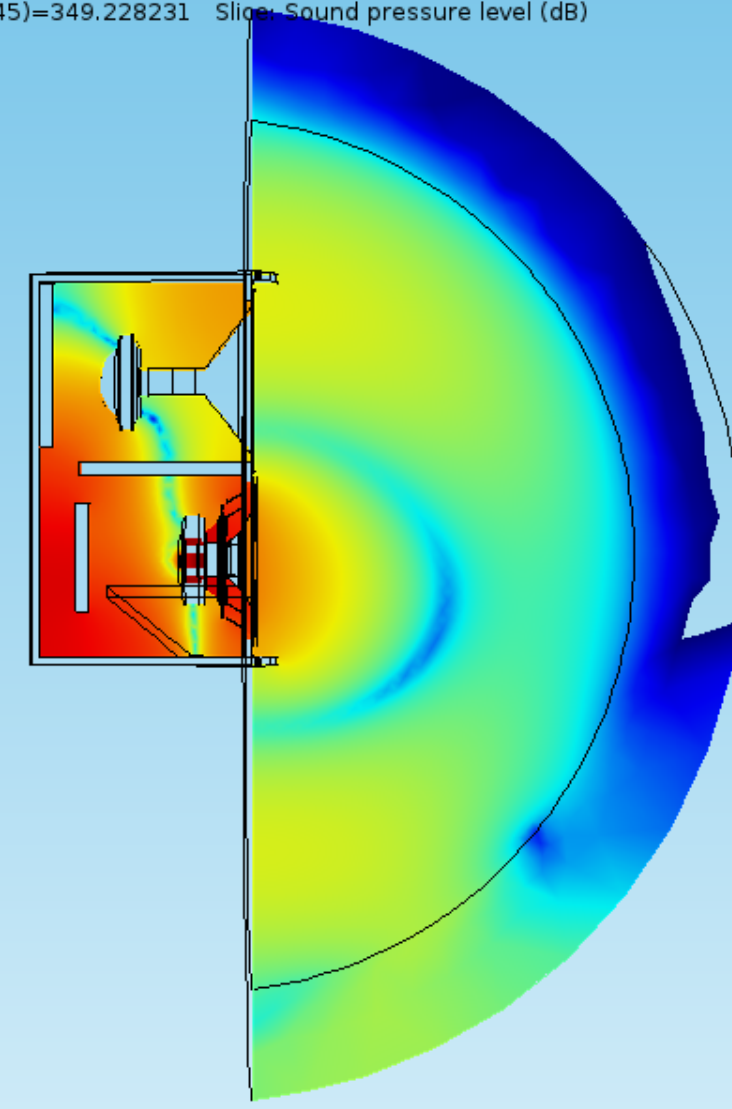
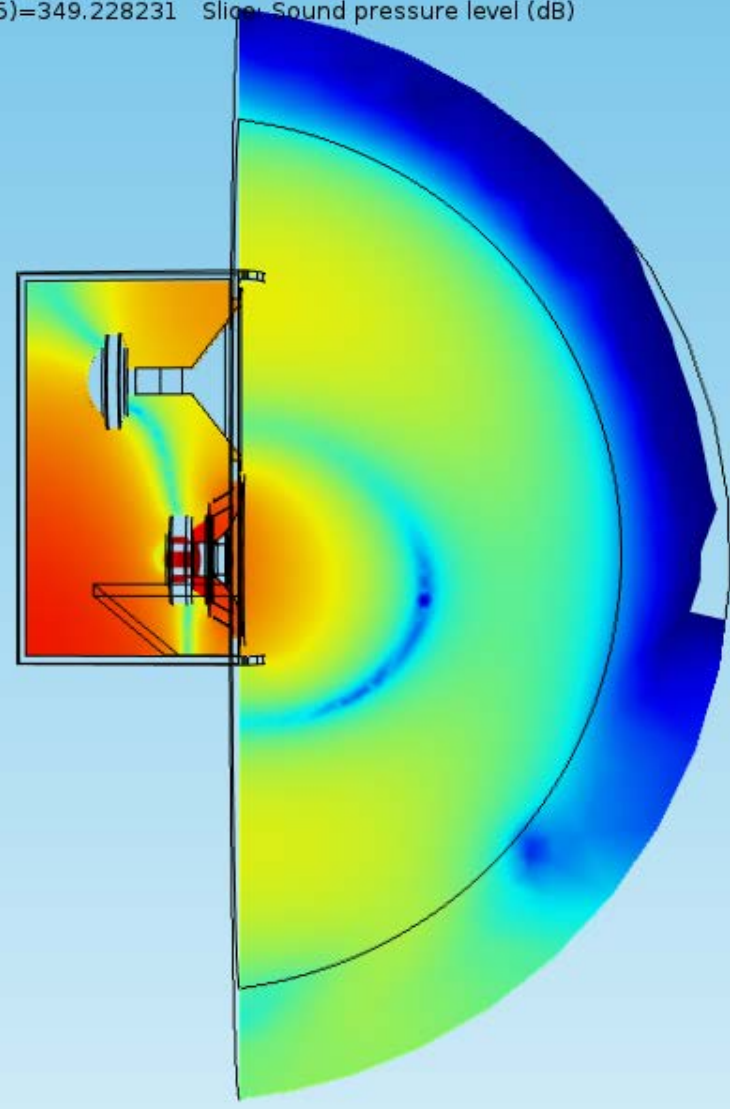
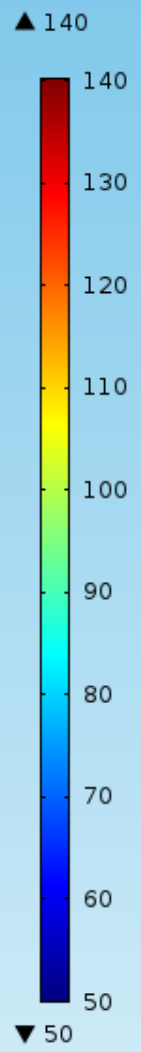
Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the two models

freq(45)=349.228231 Slice: Sound pressure level (dB)

freq(45)=349.228231 Slice: Sound pressure level (dB)



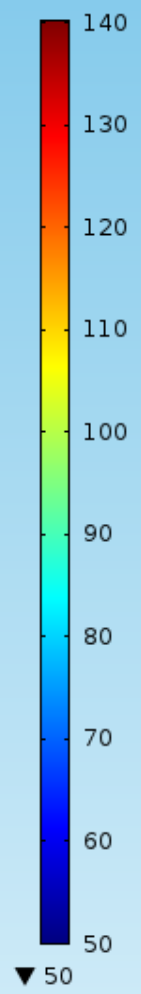
Balistreri Riccardo

Loudspeaker Design Engineer

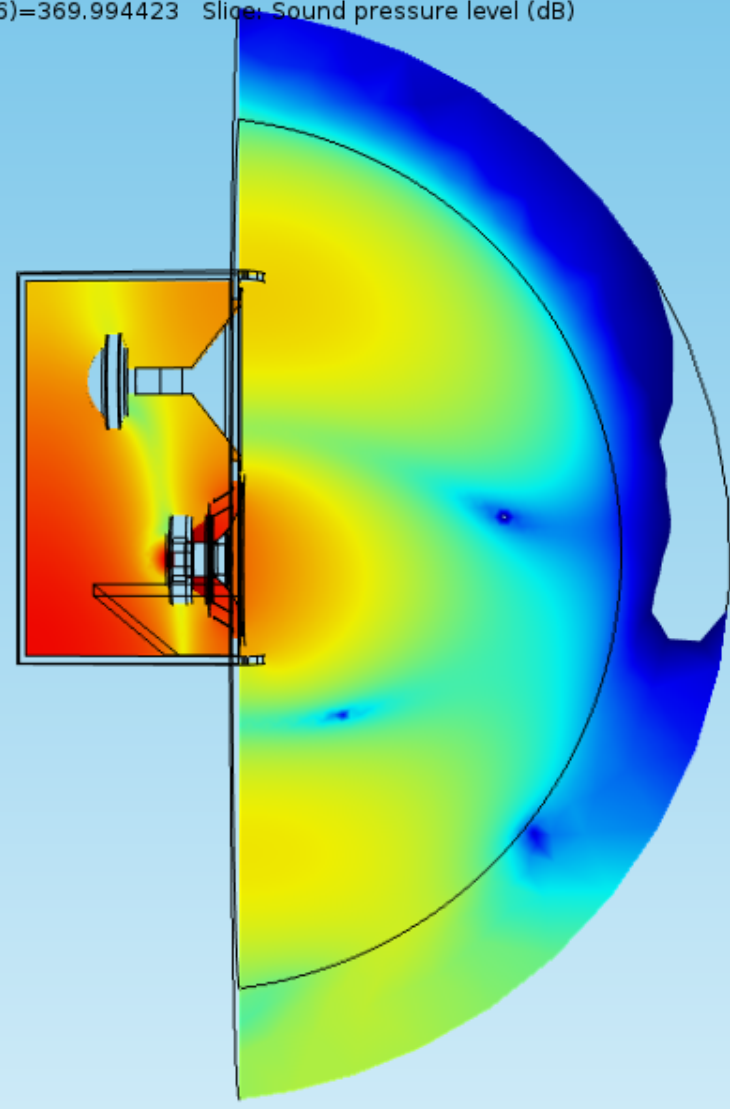
Community Professional Loudspeakers

Comparison between the two models

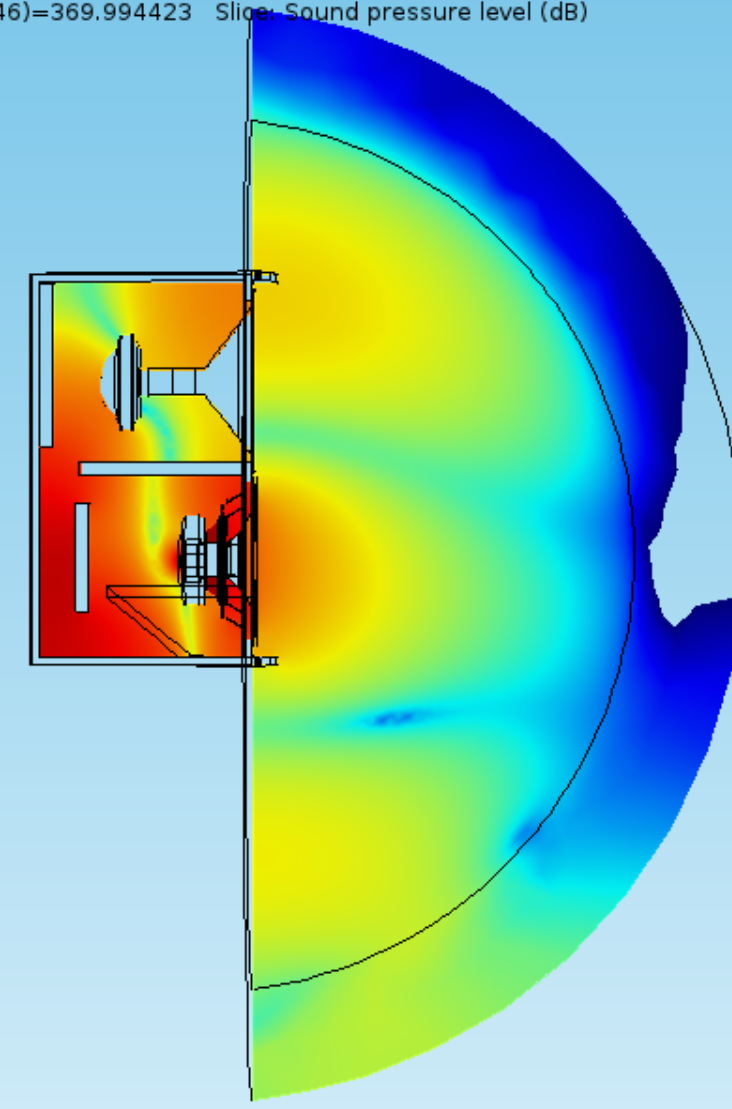




freq(46)=369.994423 Slice: Sound pressure level (dB)



freq(46)=369.994423 Slice: Sound pressure level (dB)



Balistreri Riccardo

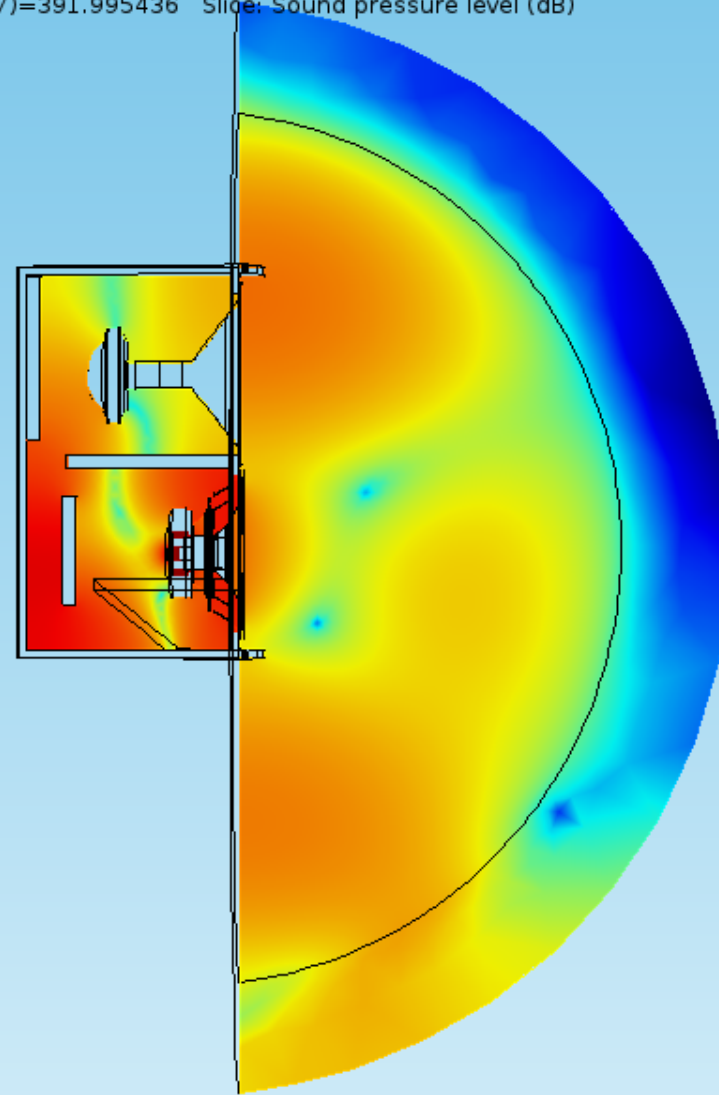
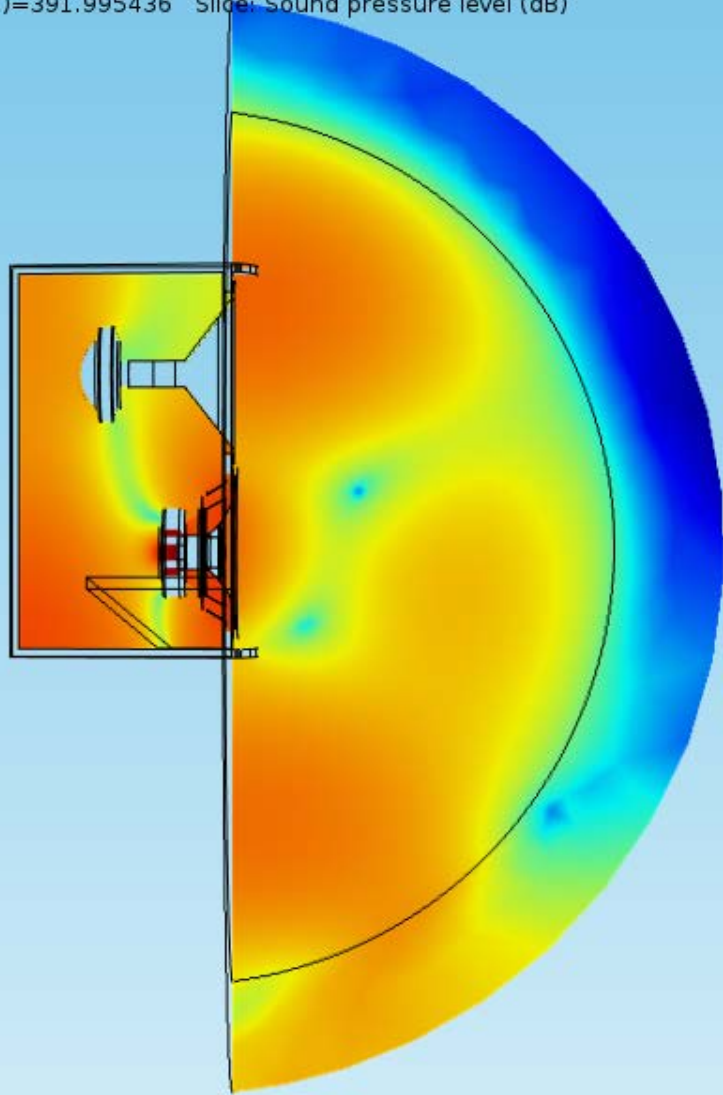
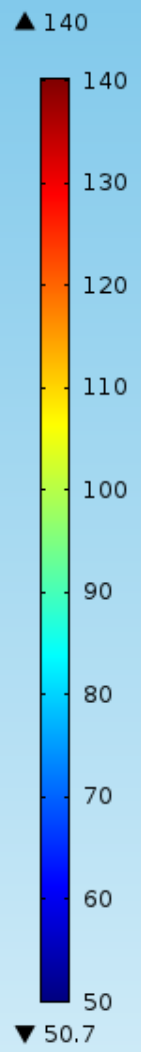
Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the two models

freq(47)=391.995436 Slice: Sound pressure level (dB)

freq(47)=391.995436 Slice: Sound pressure level (dB)



Balistreri Riccardo

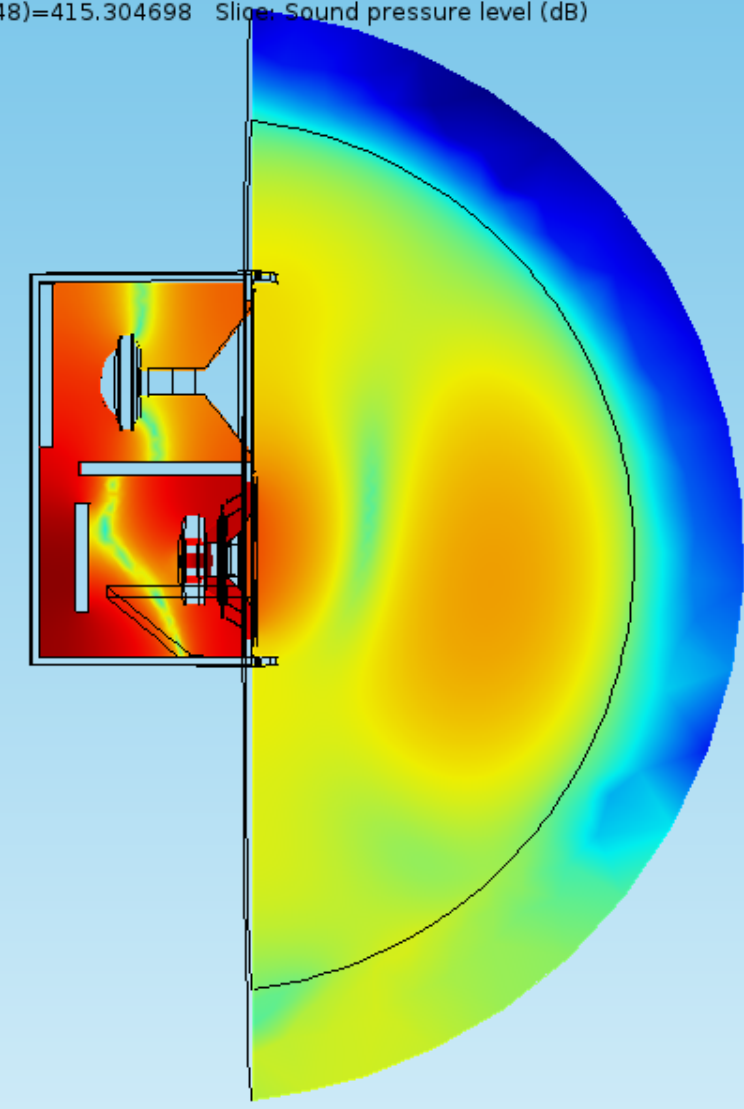
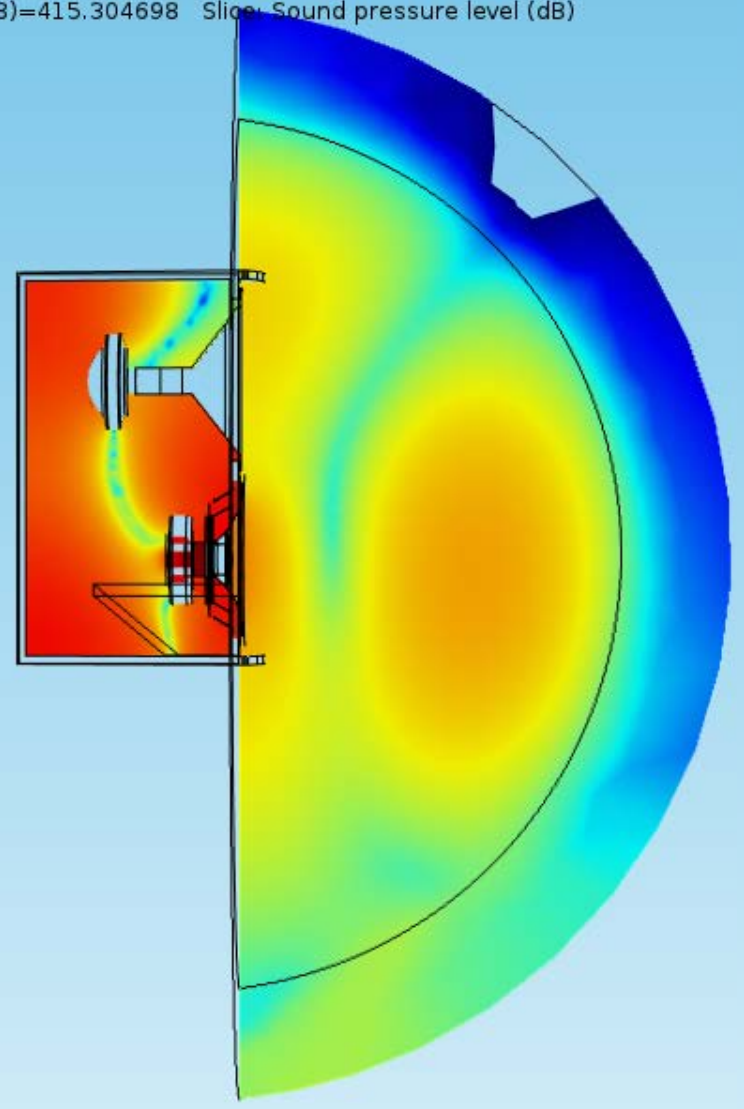
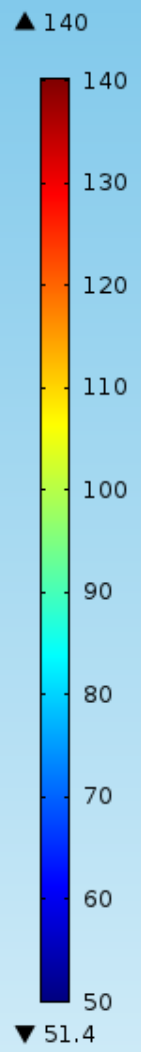
Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the two models

freq(48)=415.304698 Slice: Sound pressure level (dB)

freq(48)=415.304698 Slice: Sound pressure level (dB)



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

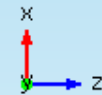
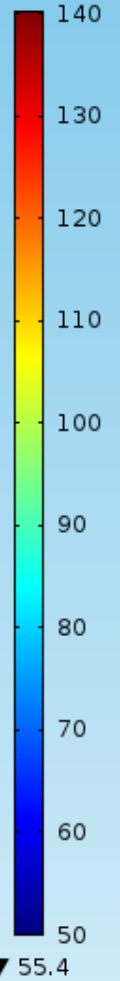
Comparison between the two models

freq(49)=440 Slice: Sound pressure level (dB)

freq(49)=440 Slice: Sound pressure level (dB)

COMSOL  
MULTIPHYSICS

▲ 130



Balistreri Riccardo

Loudspeaker Design Engineer

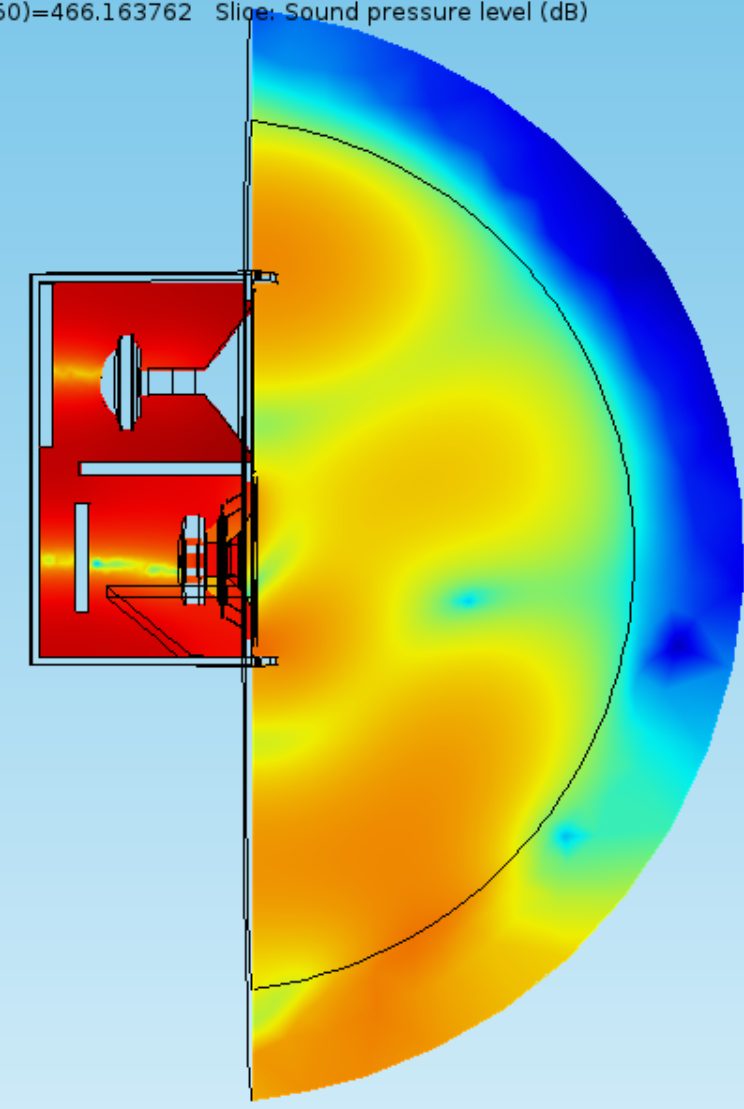
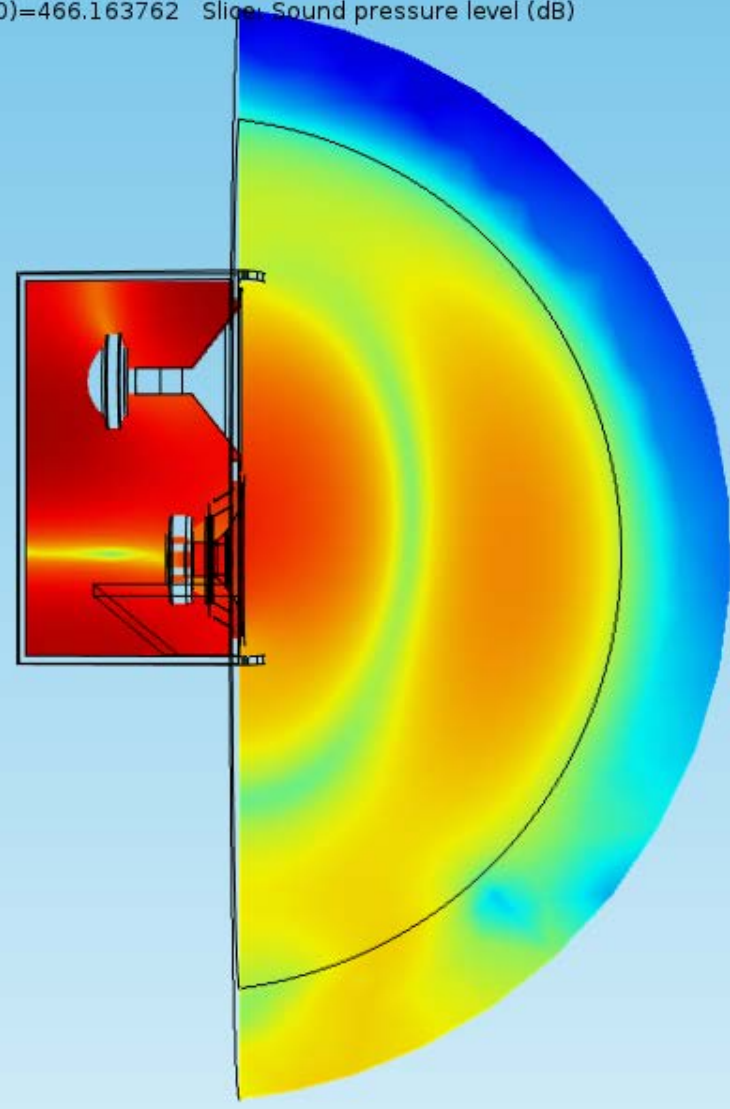
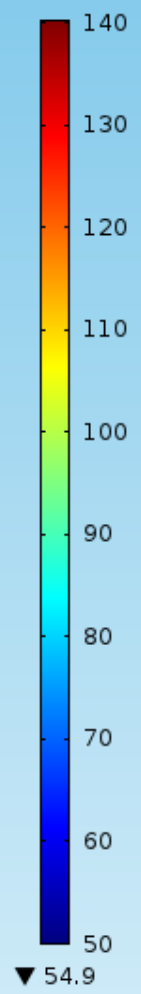
Community Professional Loudspeakers

Comparison between the  
two models

freq(50)=466.163762 Slice: Sound pressure level (dB)

freq(50)=466.163762 Slice: Sound pressure level (dB)

▲ 136



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

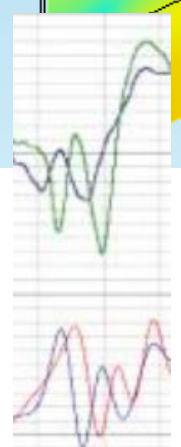
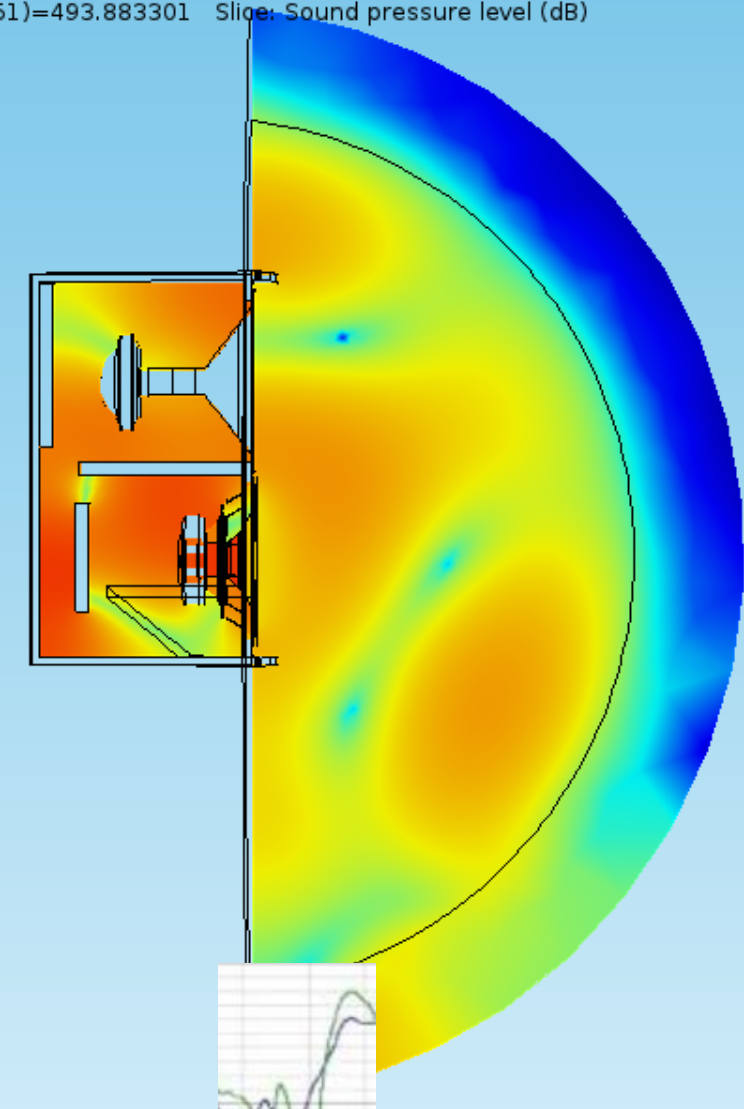
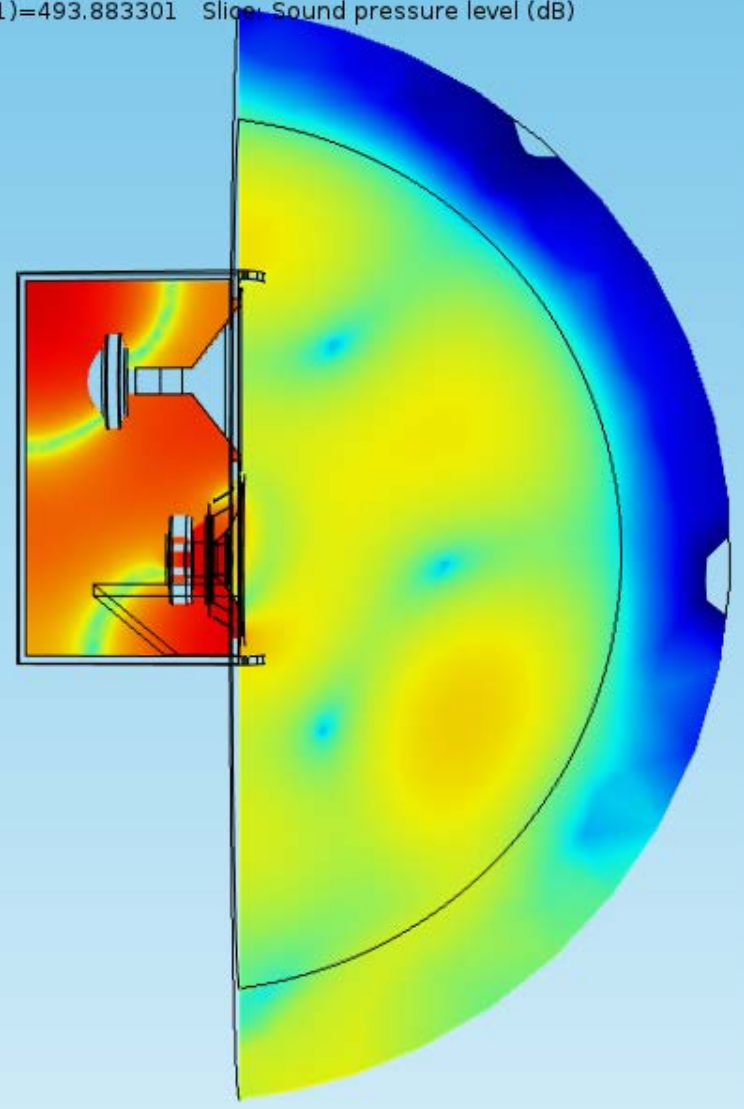
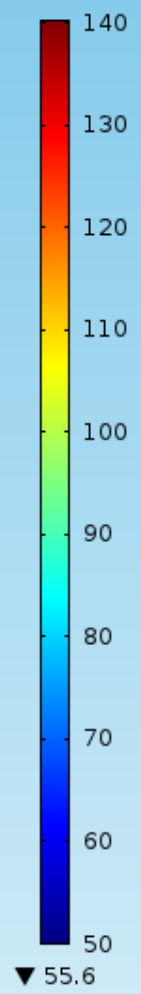
Comparison between the two models



freq(51)=493.883301 Slice: Sound pressure level (dB)

freq(51)=493.883301 Slice: Sound pressure level (dB)

▲ 124

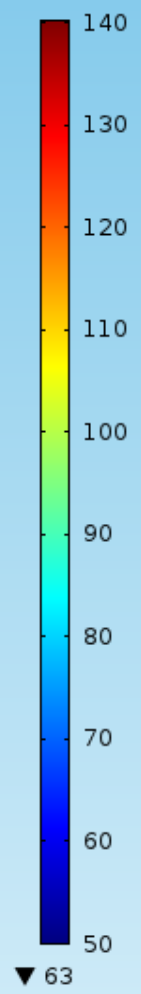


Balistreri Riccardo

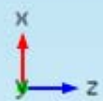
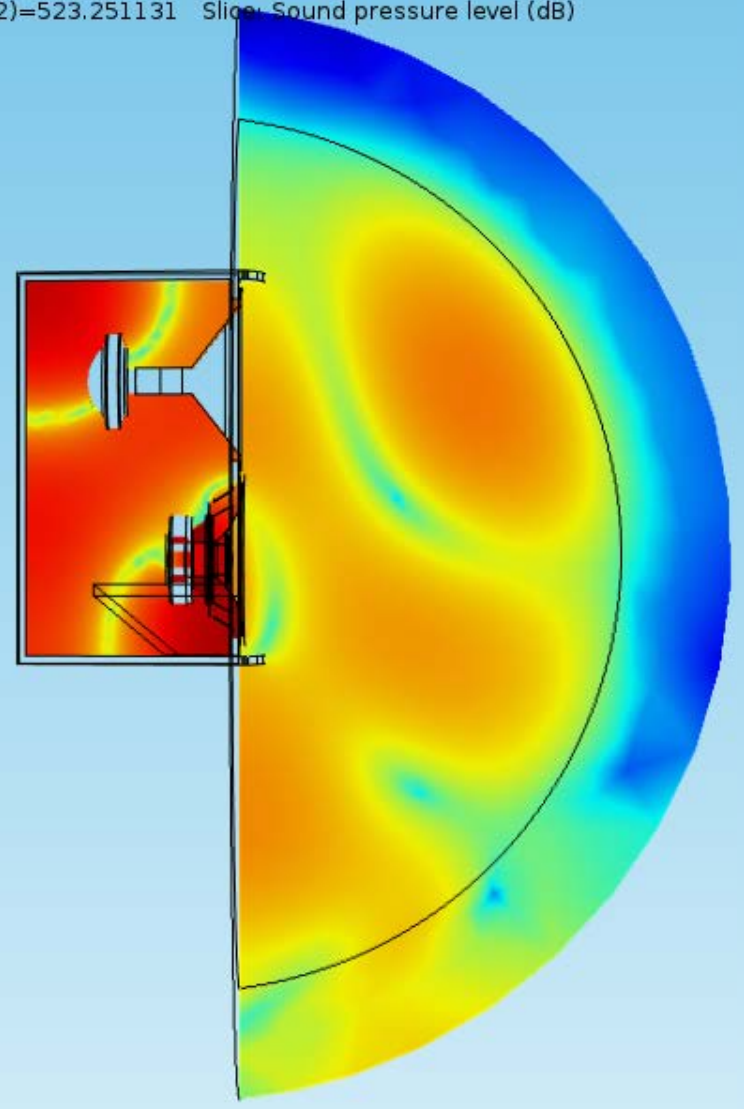
Loudspeaker Design Engineer

Community Professional Loudspeakers

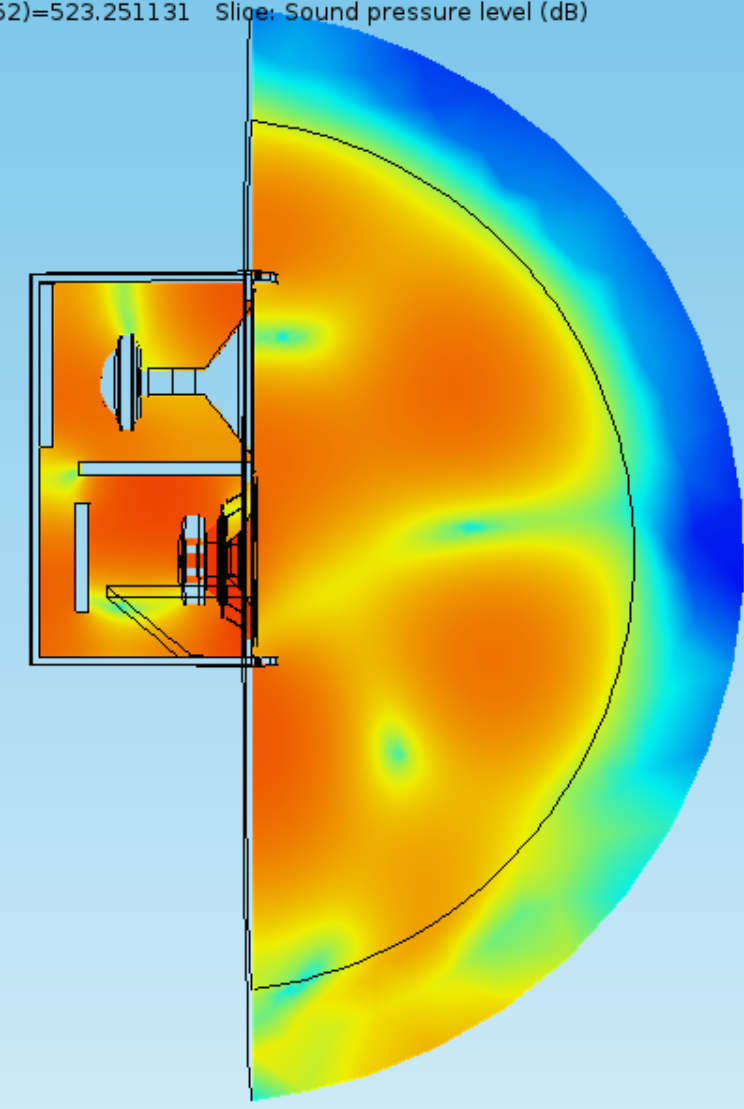
Comparison between the two models



freq(52)=523.251131 Slice: Sound pressure level (dB)



freq(52)=523.251131 Slice: Sound pressure level (dB)

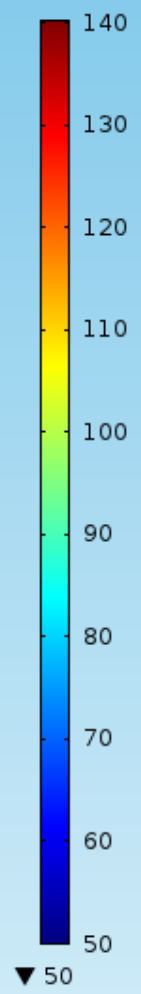


Balistreri Riccardo

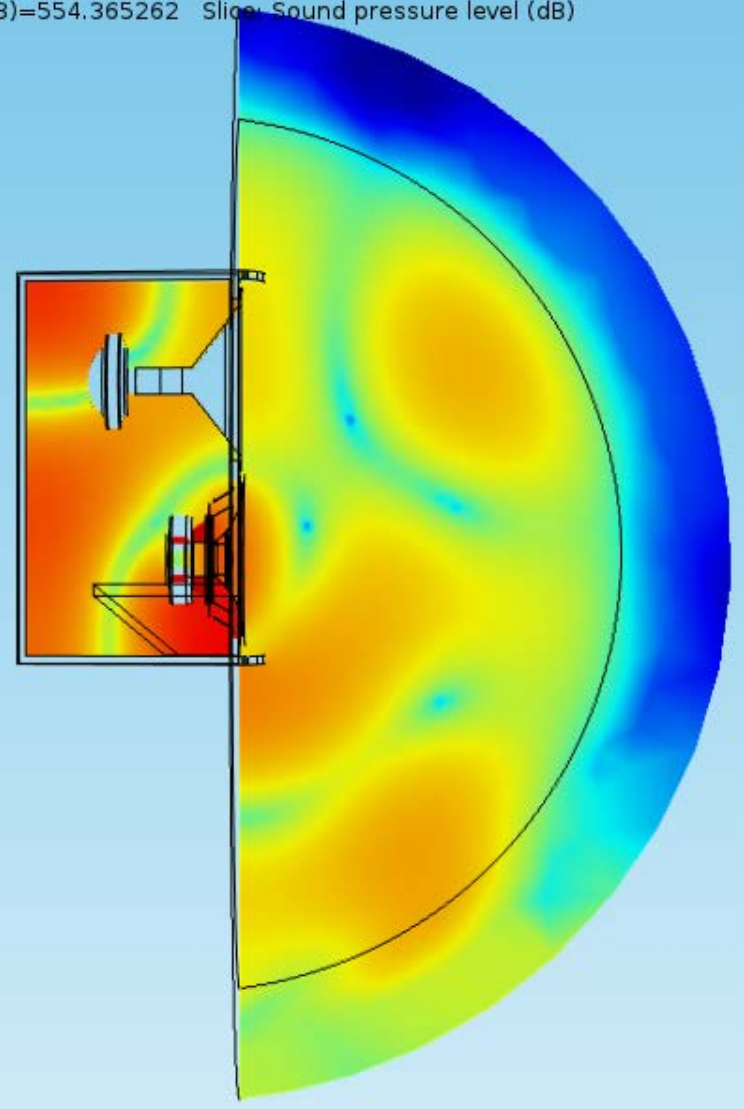
Loudspeaker Design Engineer

Community Professional Loudspeakers

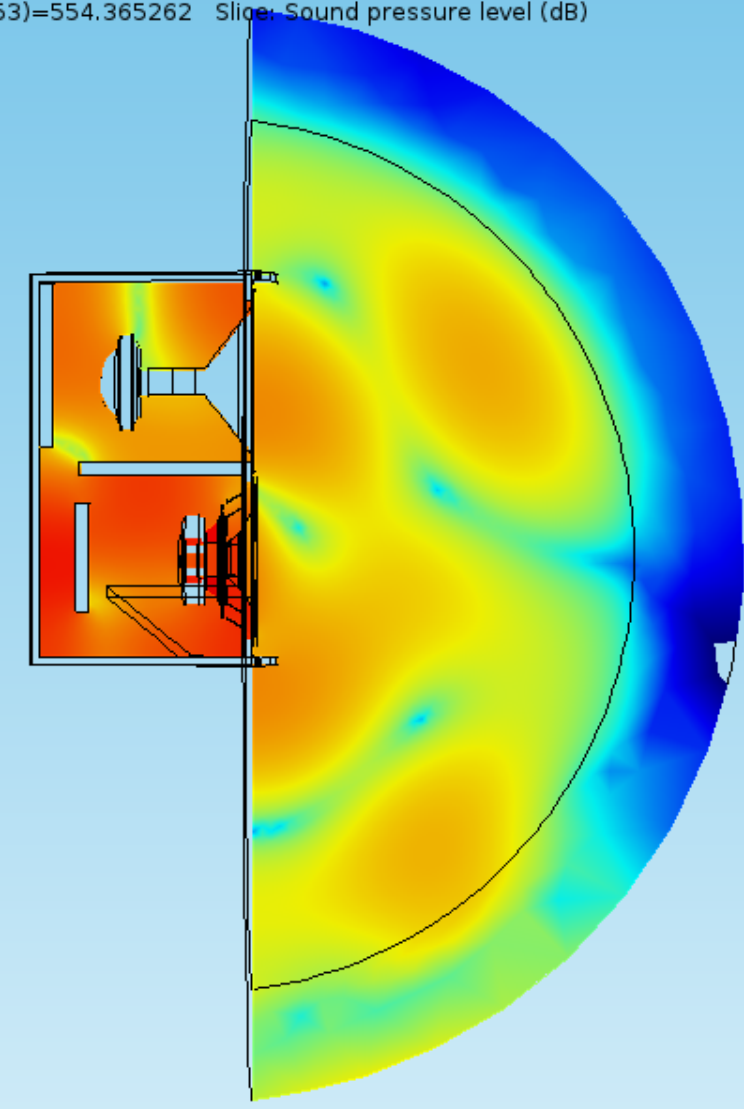
Comparison between the two models



freq(53)=554.365262 Slice: Sound pressure level (dB)



freq(53)=554.365262 Slice: Sound pressure level (dB)



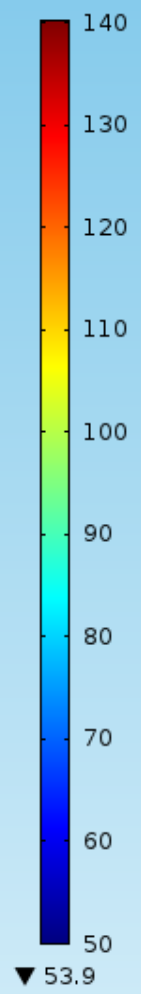
Balistreri Riccardo

Loudspeaker Design Engineer

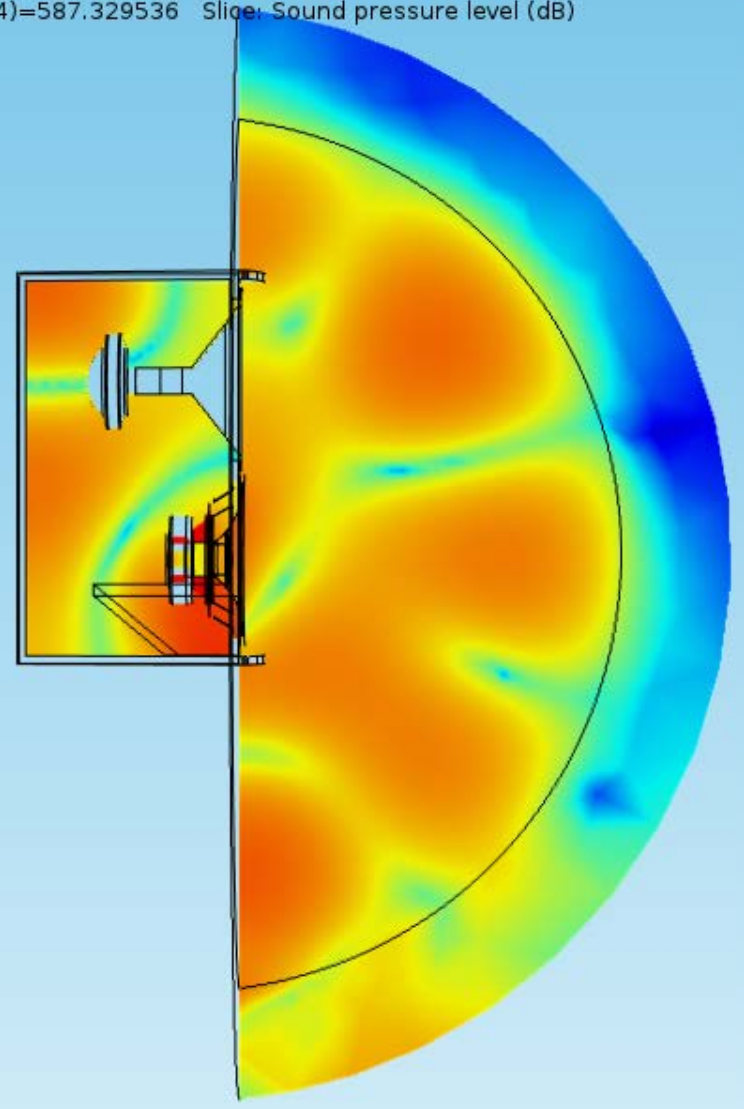
Community Professional Loudspeakers

Comparison between the two models

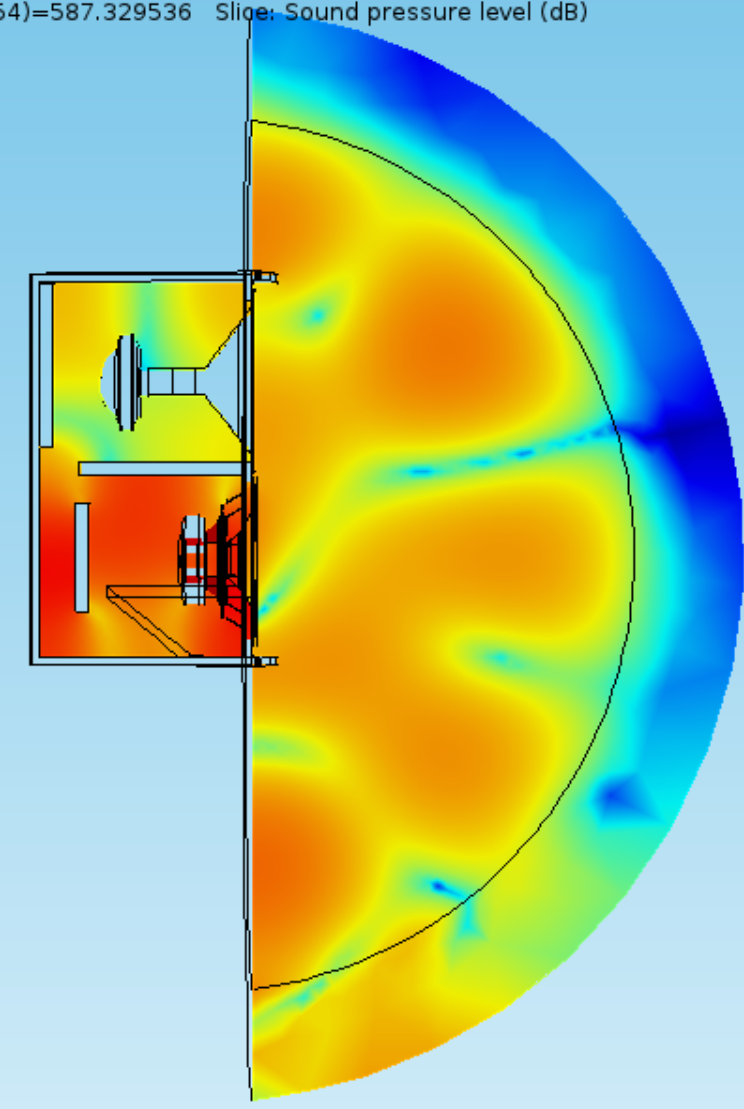




freq(54)=587.329536 Slice: Sound pressure level (dB)



freq(54)=587.329536 Slice: Sound pressure level (dB)

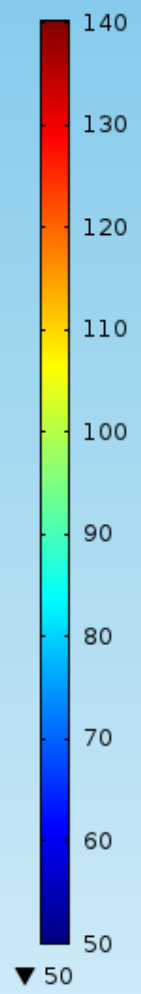


Balistreri Riccardo

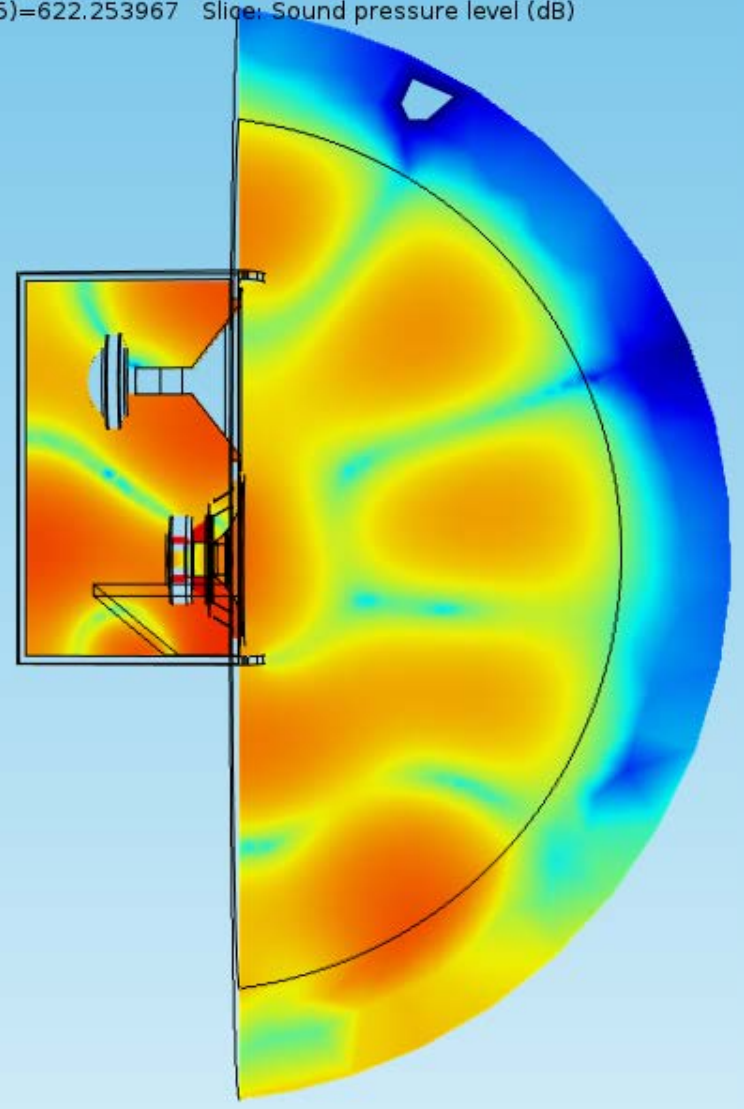
Loudspeaker Design Engineer

Community Professional Loudspeakers

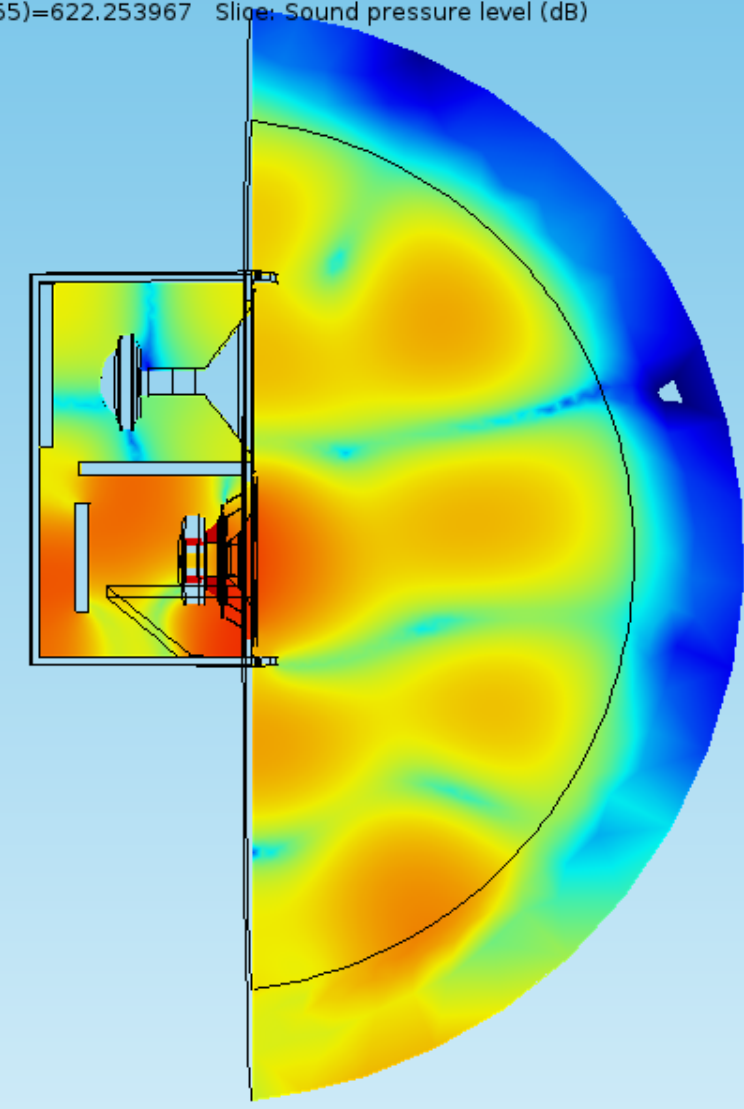
Comparison between the two models



freq(55)=622.253967 Slice: Sound pressure level (dB)



freq(55)=622.253967 Slice: Sound pressure level (dB)



Balistreri Riccardo

Loudspeaker Design Engineer

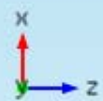
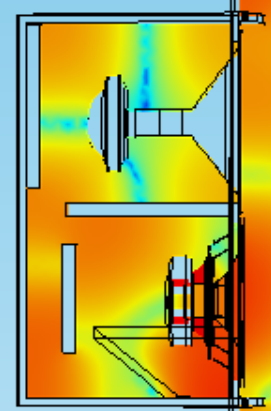
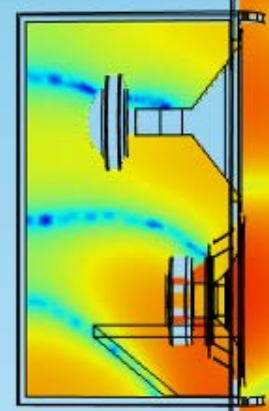
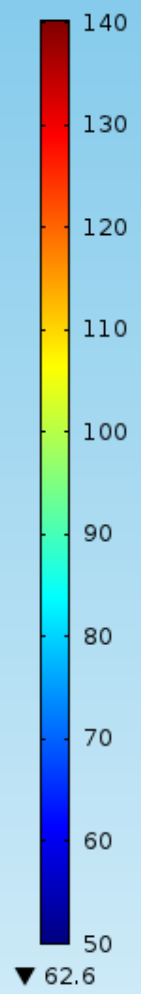
Community Professional Loudspeakers

Comparison between the two models

freq(56)=659.255114 Slice: Sound pressure level (dB)

freq(56)=659.255114 Slice: Sound pressure level (dB)

▲ 130

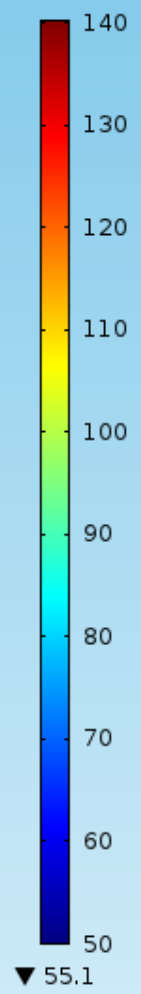


Balistreri Riccardo

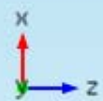
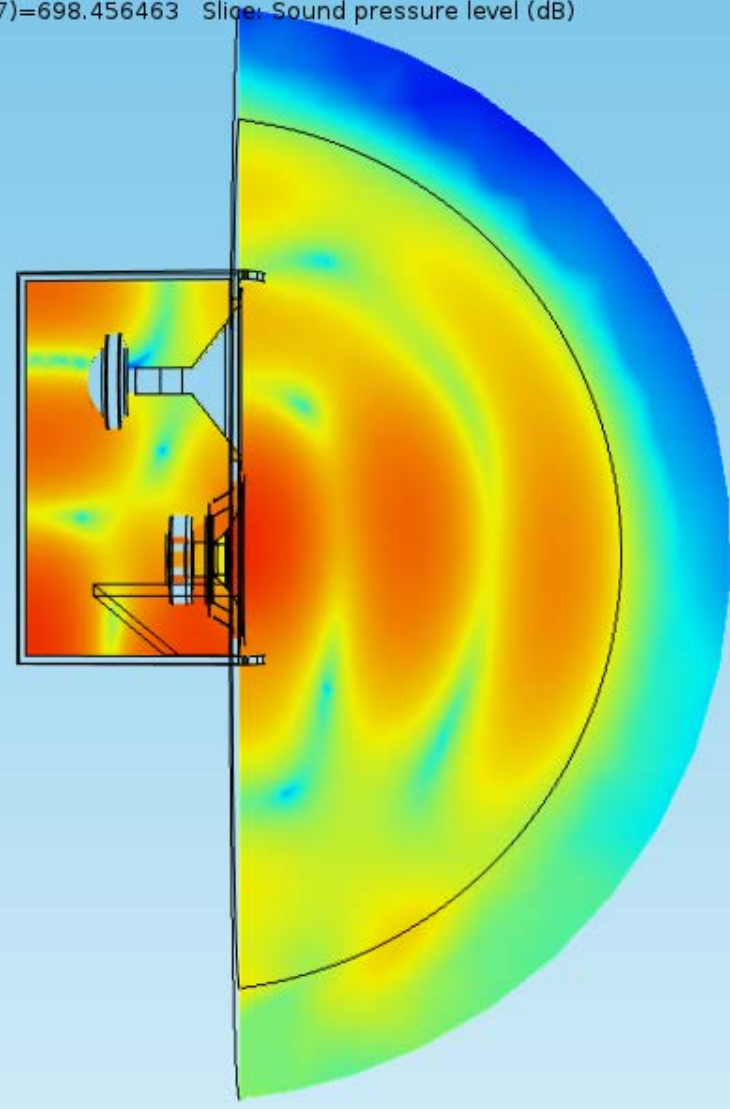
Loudspeaker Design Engineer

Community Professional Loudspeakers

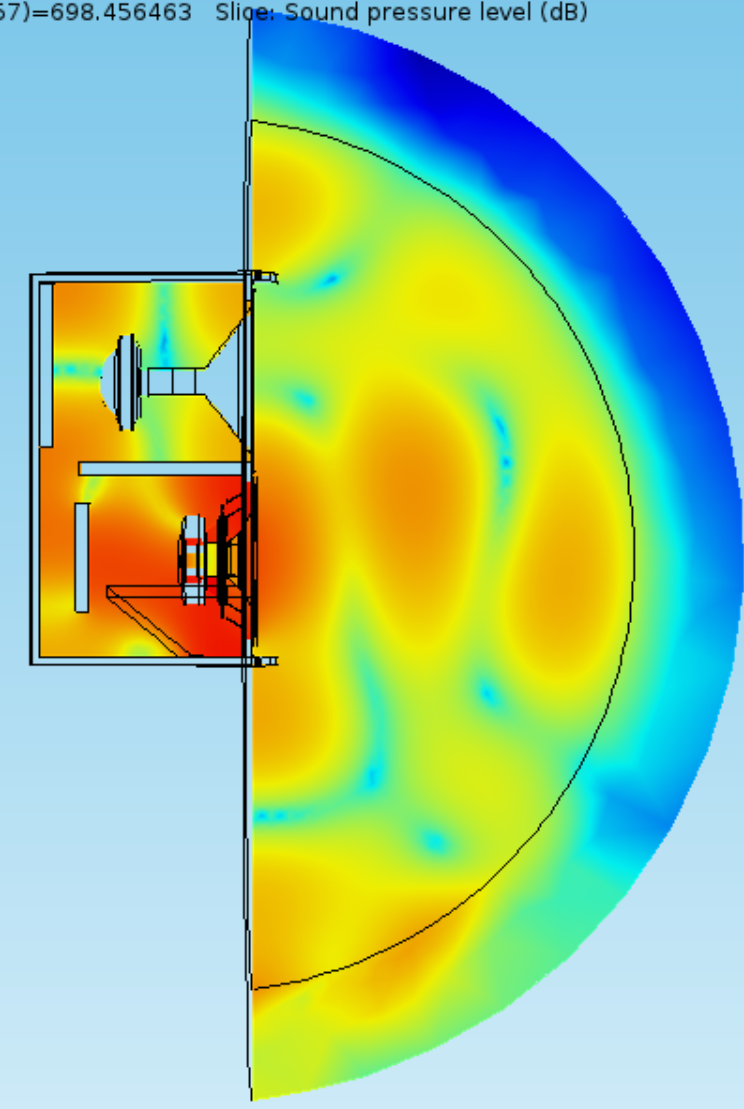
Comparison between the two models



freq(57)=698.456463 Slice: Sound pressure level (dB)



freq(57)=698.456463 Slice: Sound pressure level (dB)



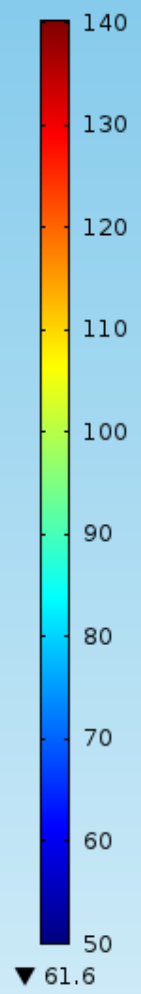
Balistreri Riccardo

Loudspeaker Design Engineer

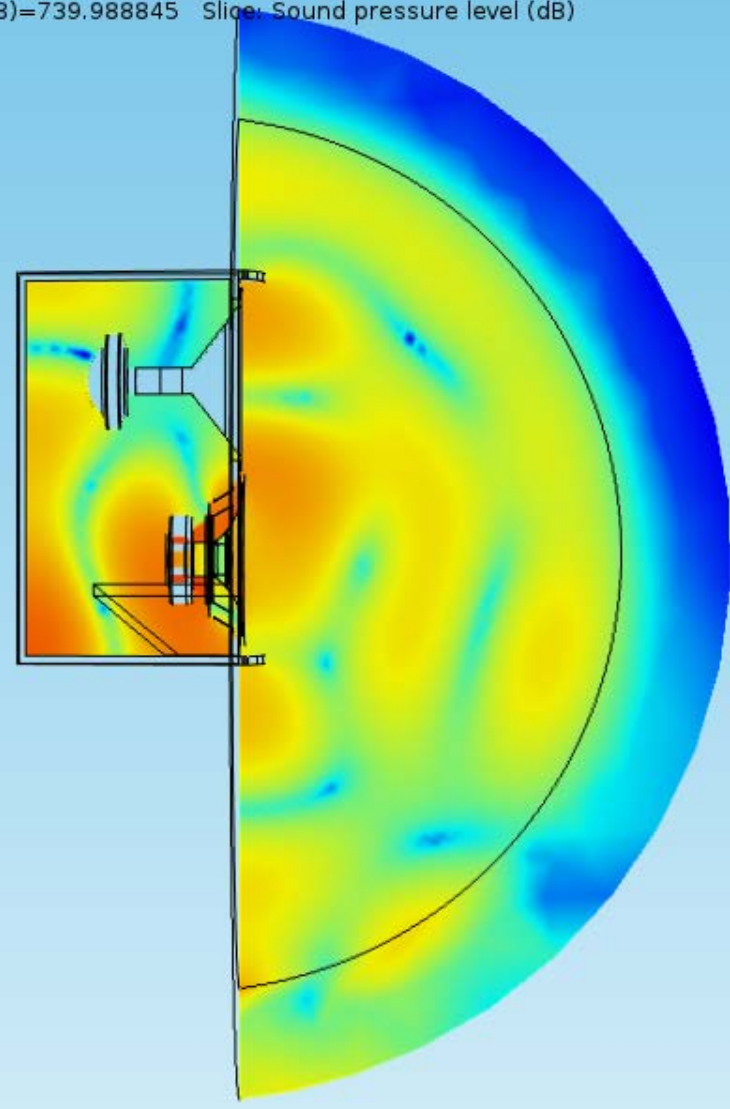
Community Professional Loudspeakers

Comparison between the two models

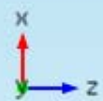
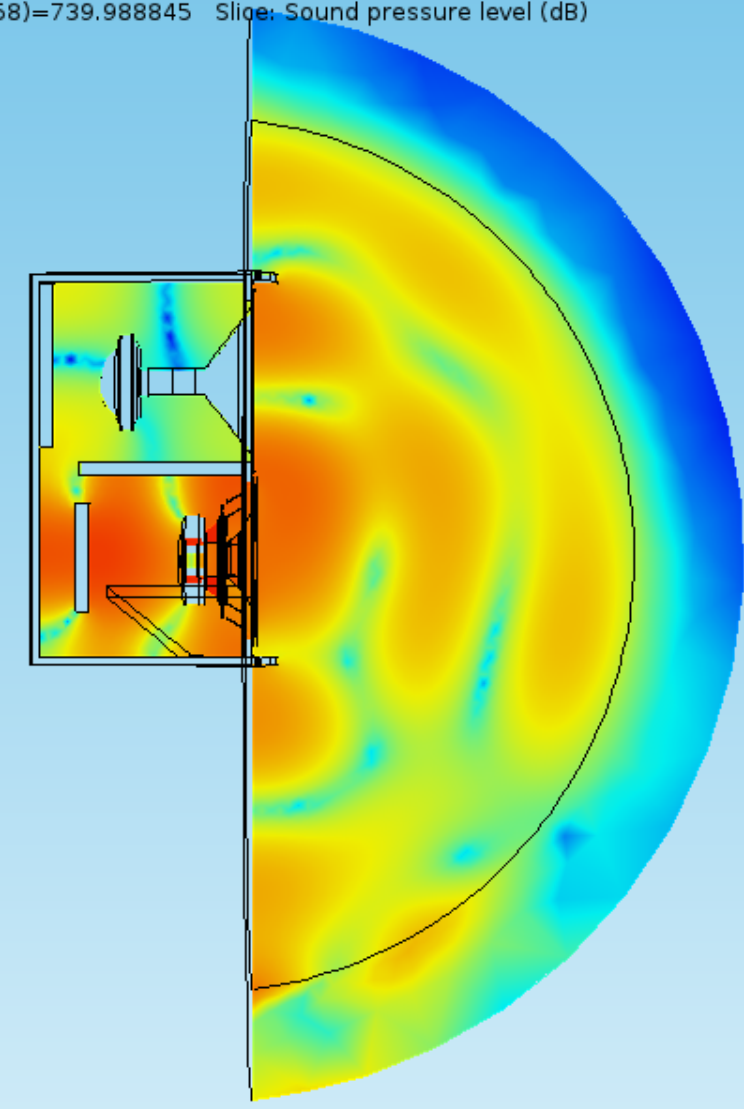




freq(58)=739.988845 Slice: Sound pressure level (dB)



freq(58)=739.988845 Slice: Sound pressure level (dB)

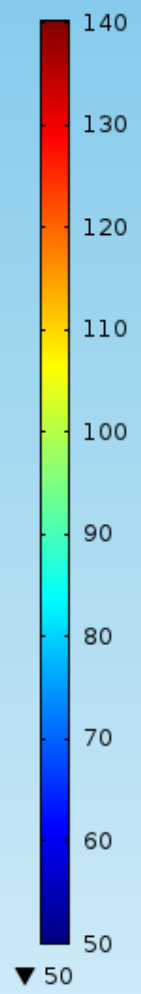


Balistreri Riccardo

Loudspeaker Design Engineer

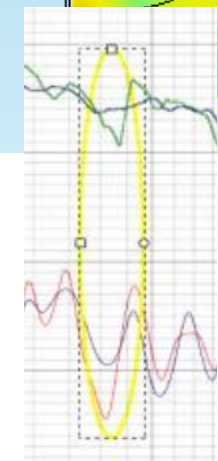
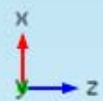
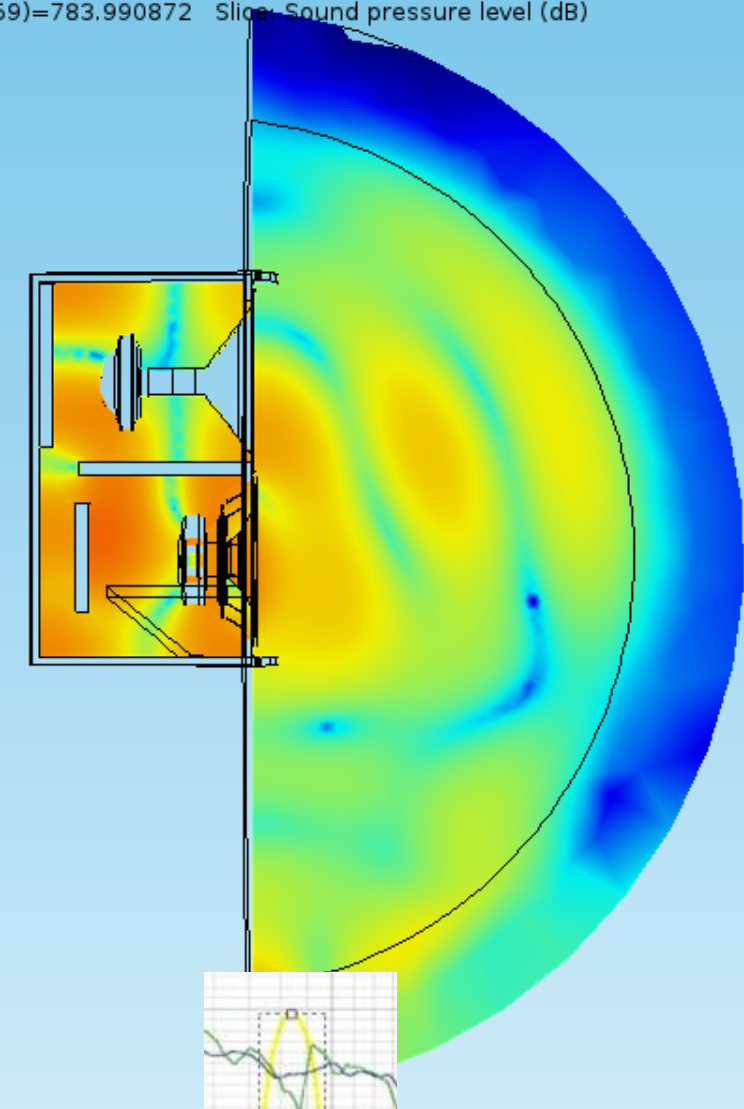
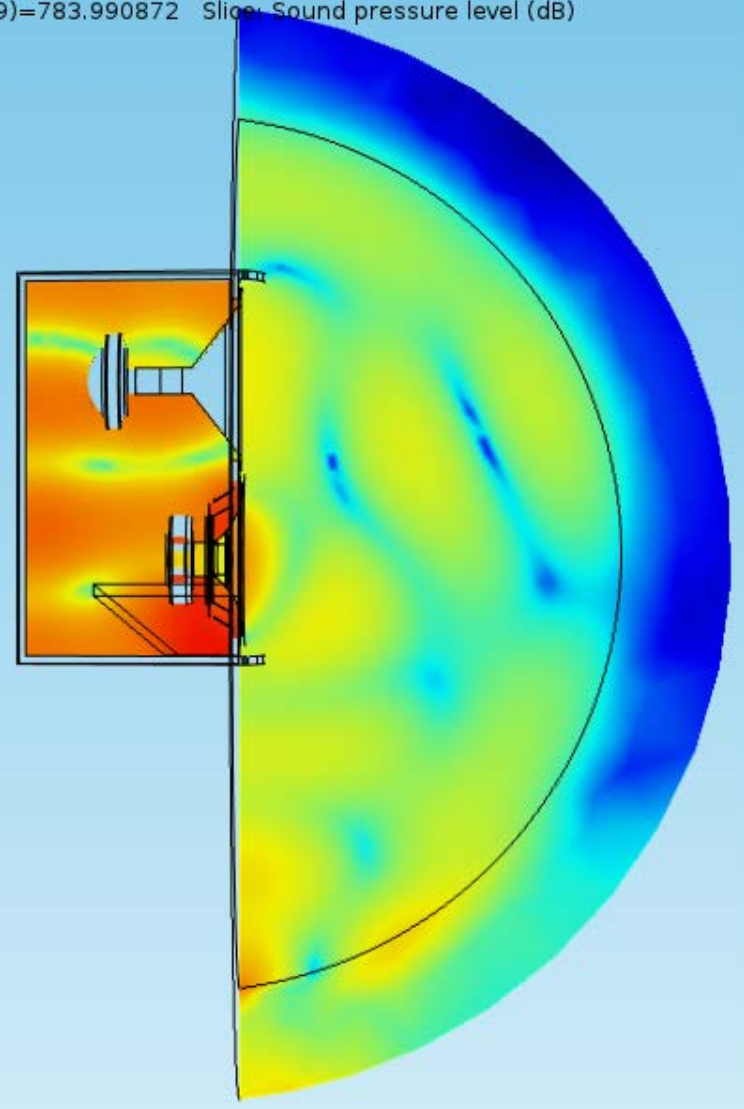
Community Professional Loudspeakers

Comparison between the two models



freq(59)=783.990872 Slice: Sound pressure level (dB)

freq(59)=783.990872 Slice: Sound pressure level (dB)

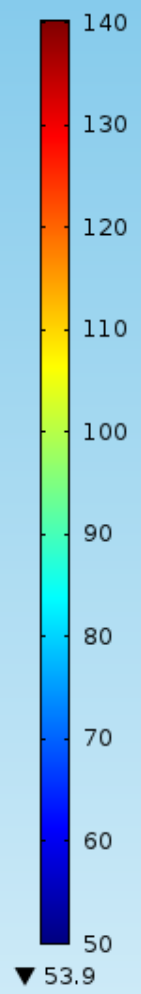


Balistreri Riccardo

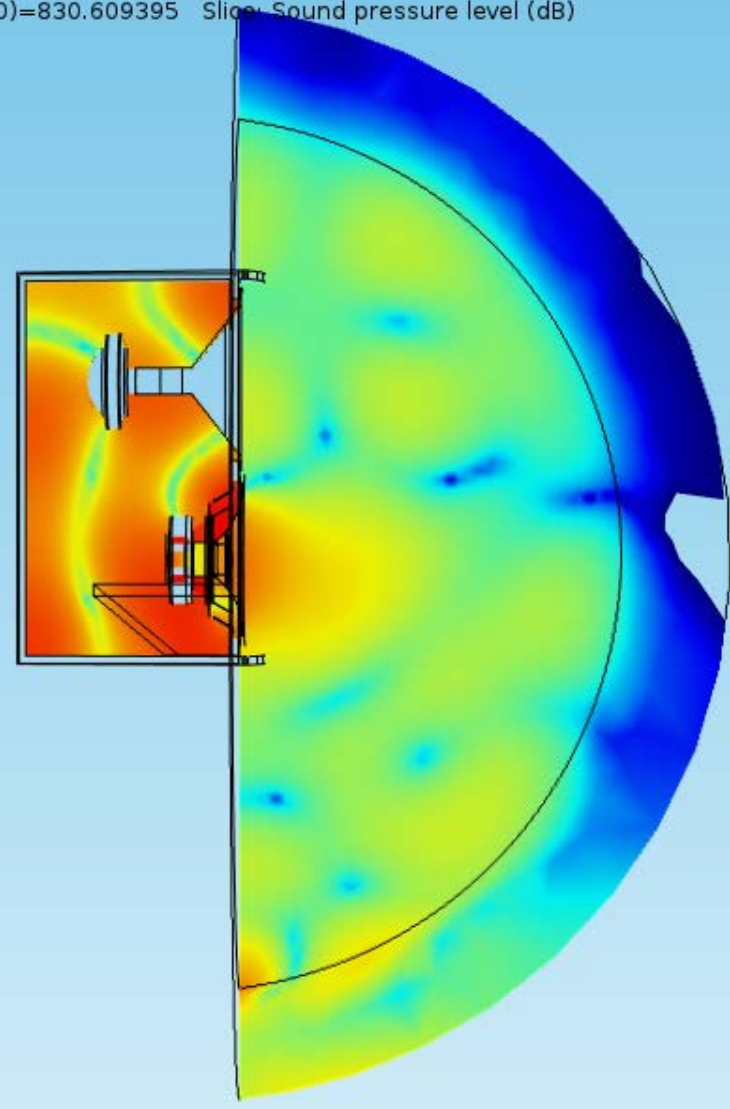
Loudspeaker Design Engineer

Community Professional Loudspeakers

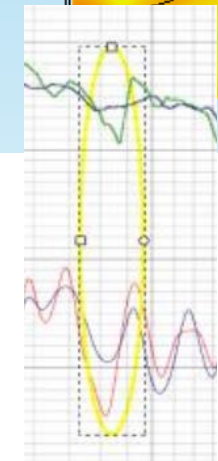
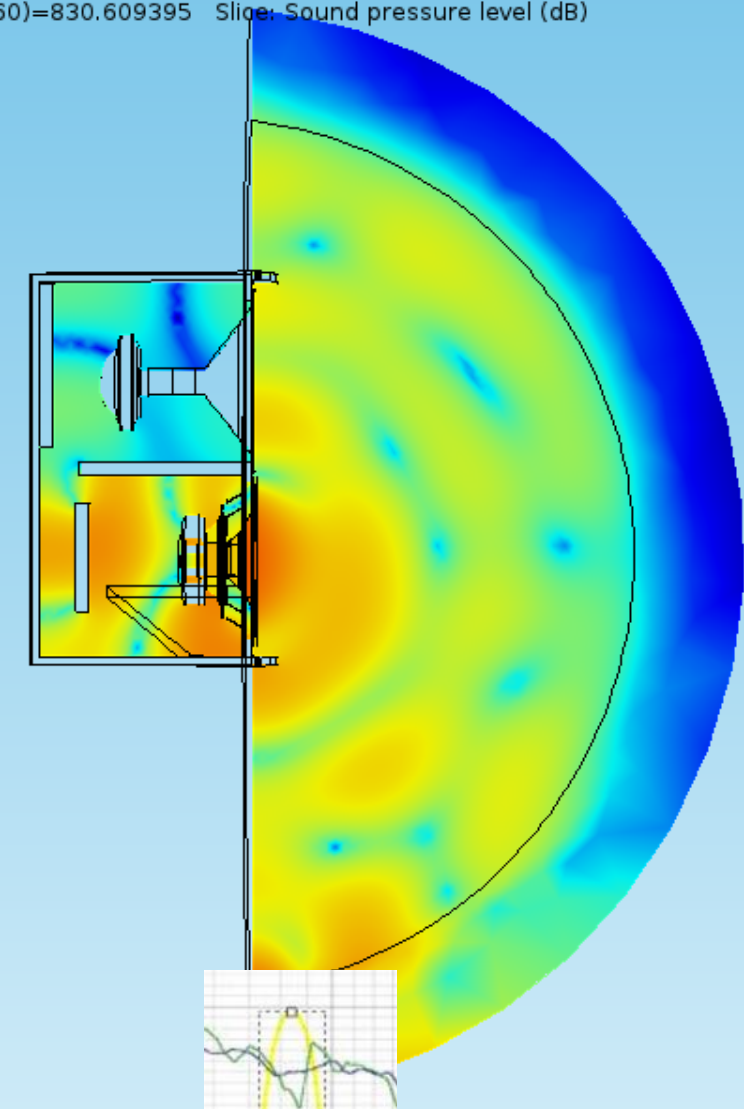
Comparison between the two models



freq(60)=830.609395 Slice: Sound pressure level (dB)



freq(60)=830.609395 Slice: Sound pressure level (dB)



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the two models

freq(61)=880 Slice: Sound pressure level (dB)

freq(61)=880 Slice: Sound pressure level (dB)

▲ 120

140

130

120

110

100

90

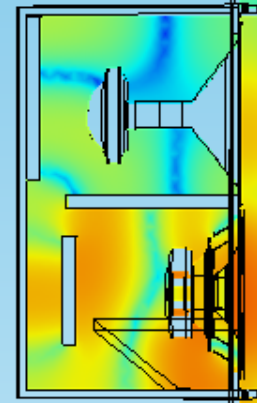
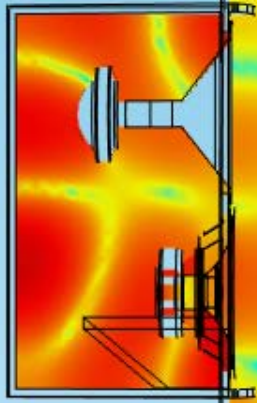
80

70

60

50

▼ 59.3



Balistreri Riccardo

Loudspeaker Design Engineer

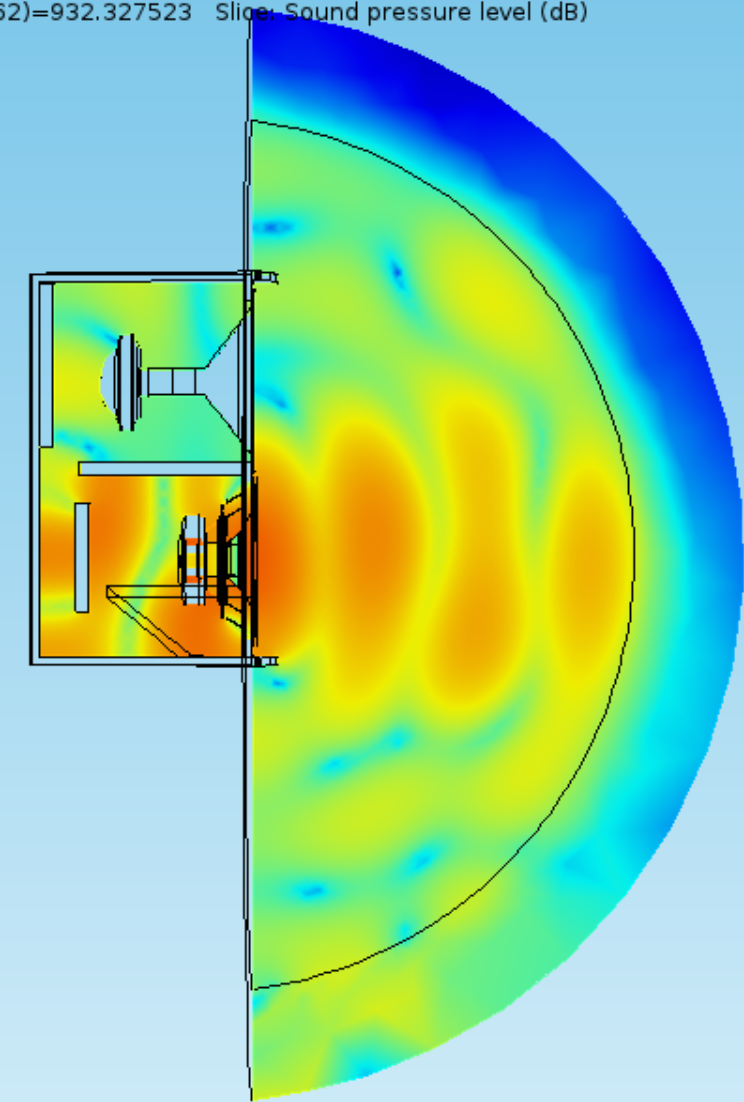
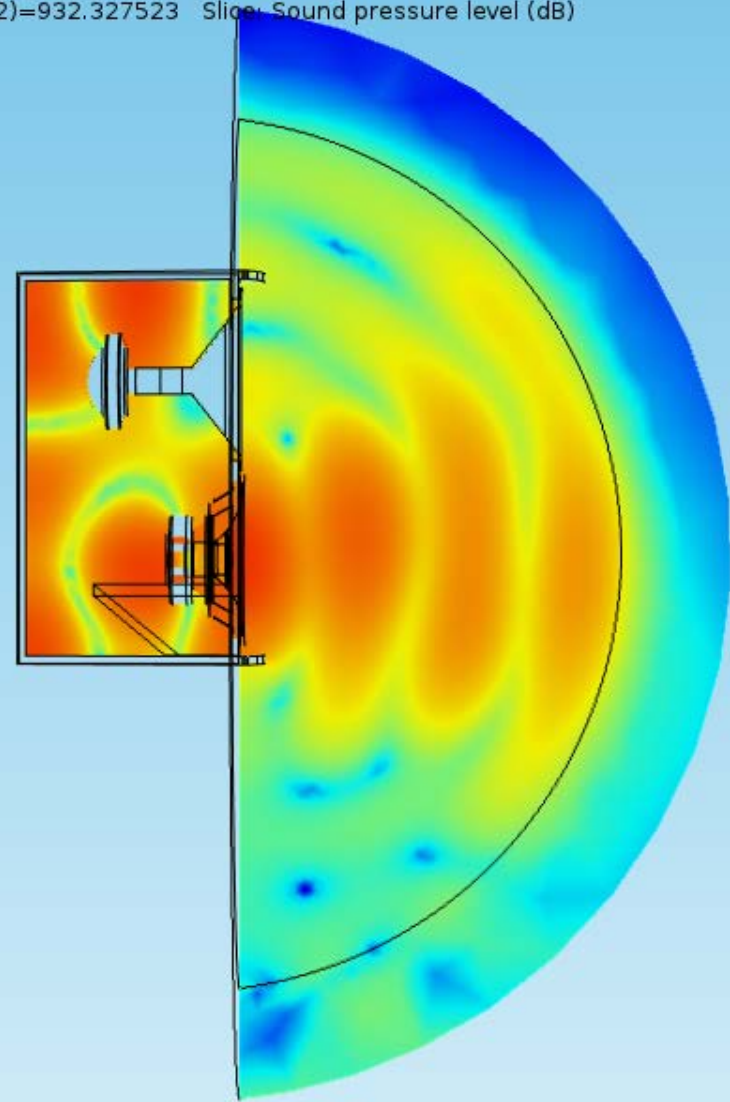
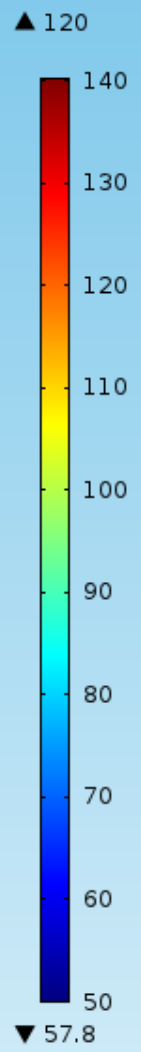
Community Professional Loudspeakers

Comparison between the  
two models



freq(62)=932.327523 Slice: Sound pressure level (dB)

freq(62)=932.327523 Slice: Sound pressure level (dB)

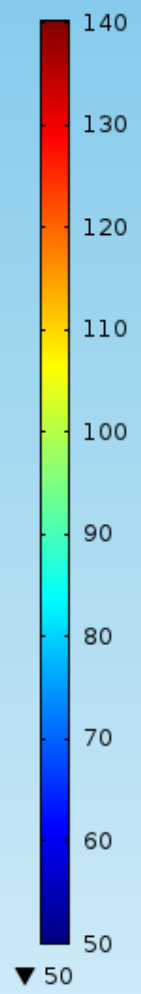


Balistreri Riccardo

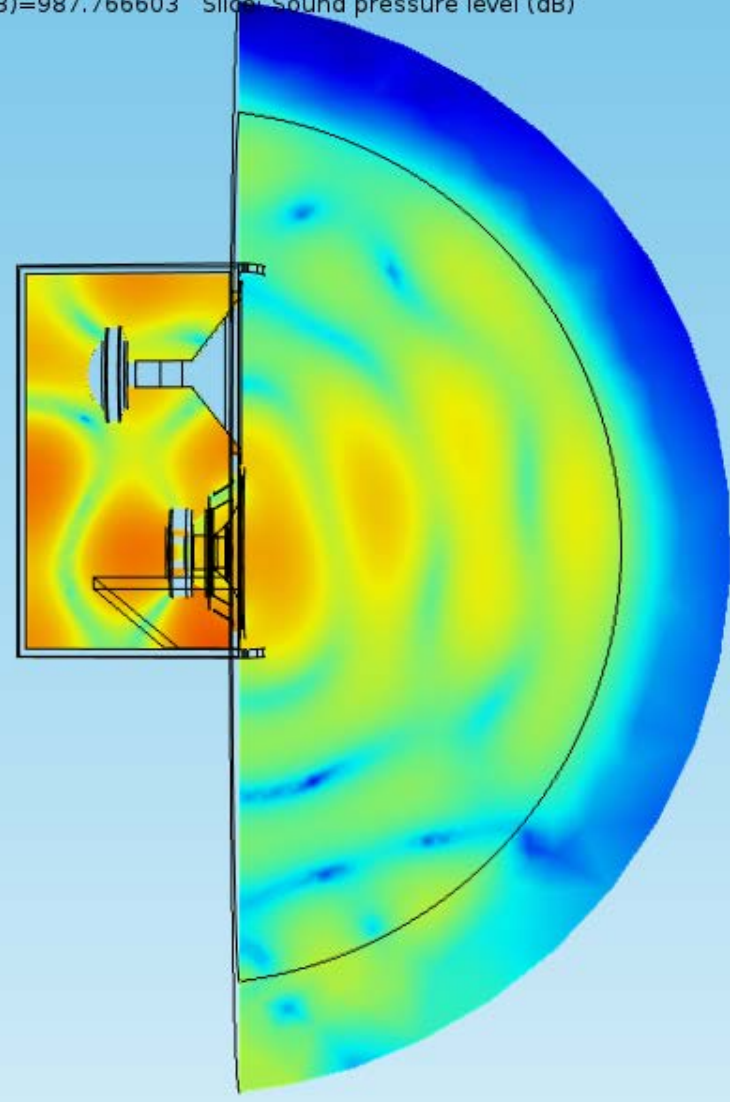
Loudspeaker Design Engineer

Community Professional Loudspeakers

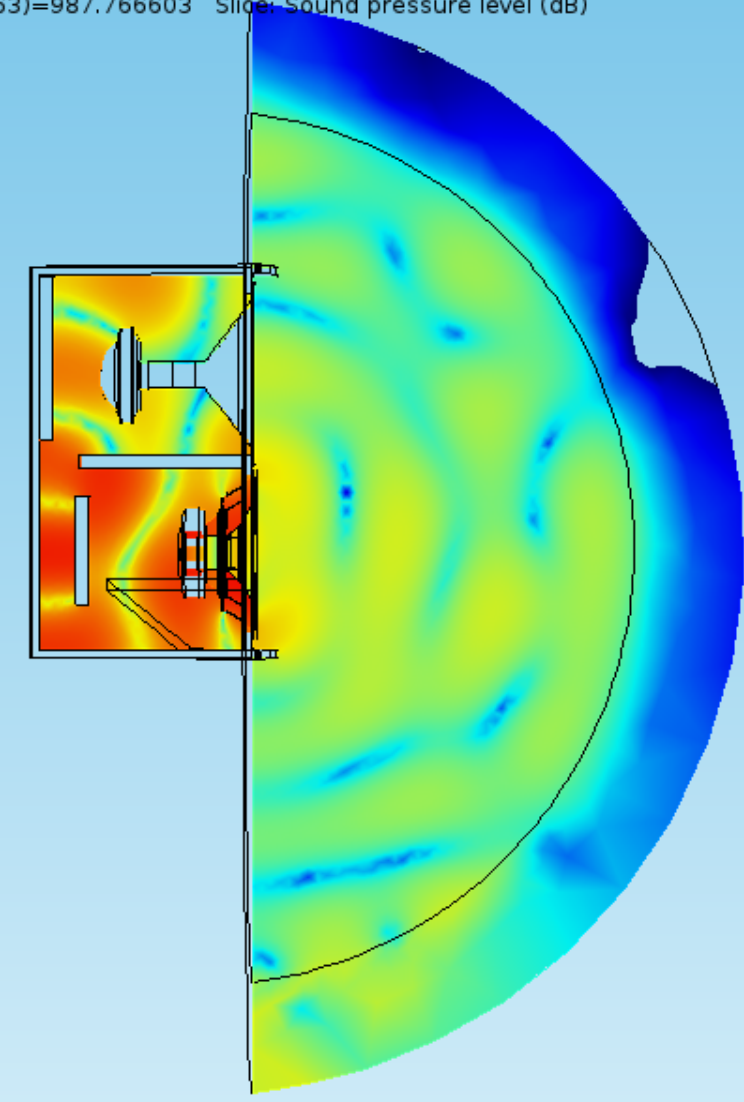
Comparison between the two models



freq(63)=987.766603 Slice: Sound pressure level (dB)



freq(63)=987.766603 Slice: Sound pressure level (dB)



Balistreri Riccardo

Loudspeaker Design Engineer

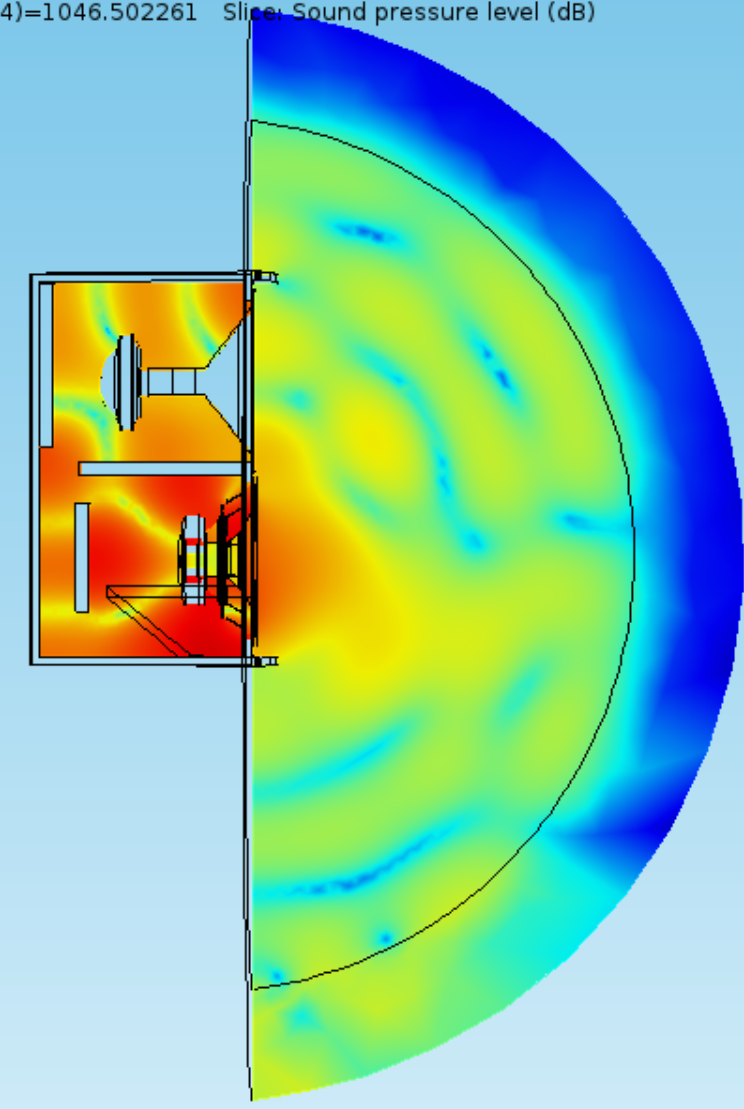
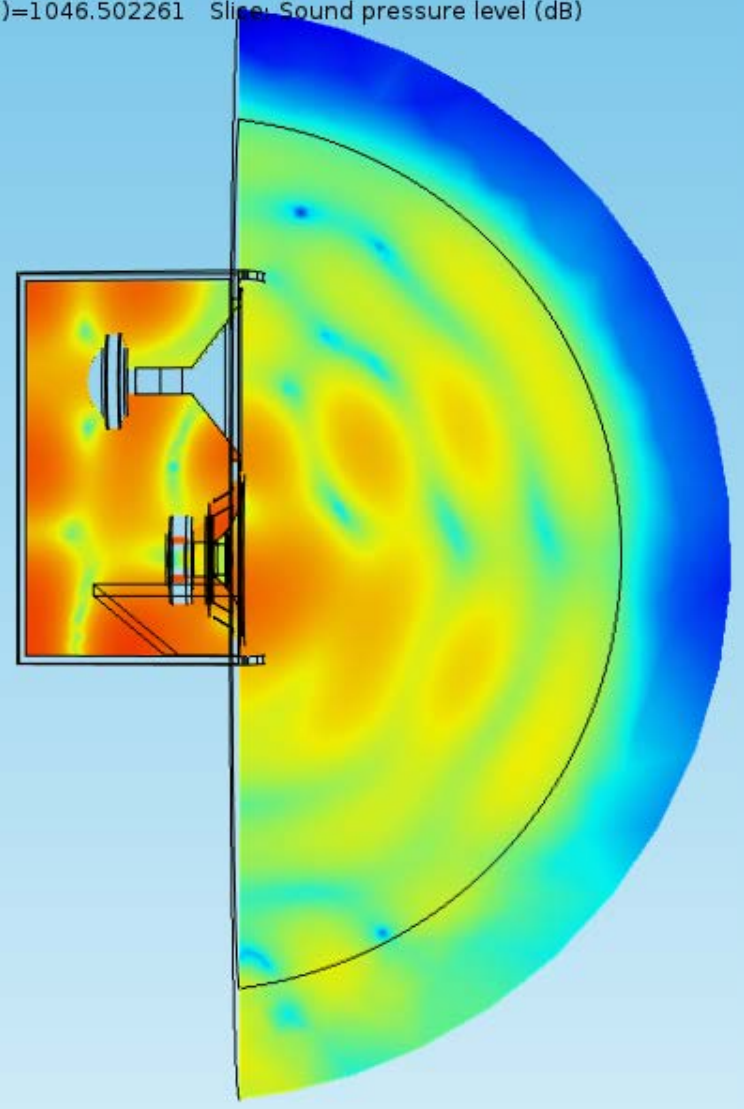
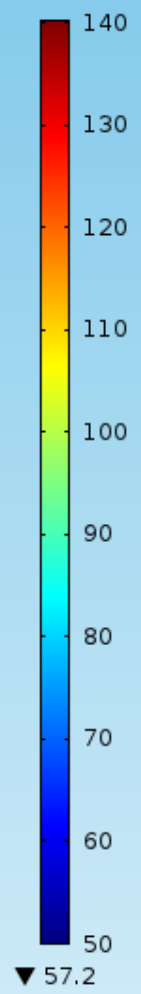
Community Professional Loudspeakers

Comparison between the two models

freq(64)=1046.502261 Slice: Sound pressure level (dB)

freq(64)=1046.502261 Slice: Sound pressure level (dB)

▲ 131



Balistreri Riccardo

Loudspeaker Design Engineer

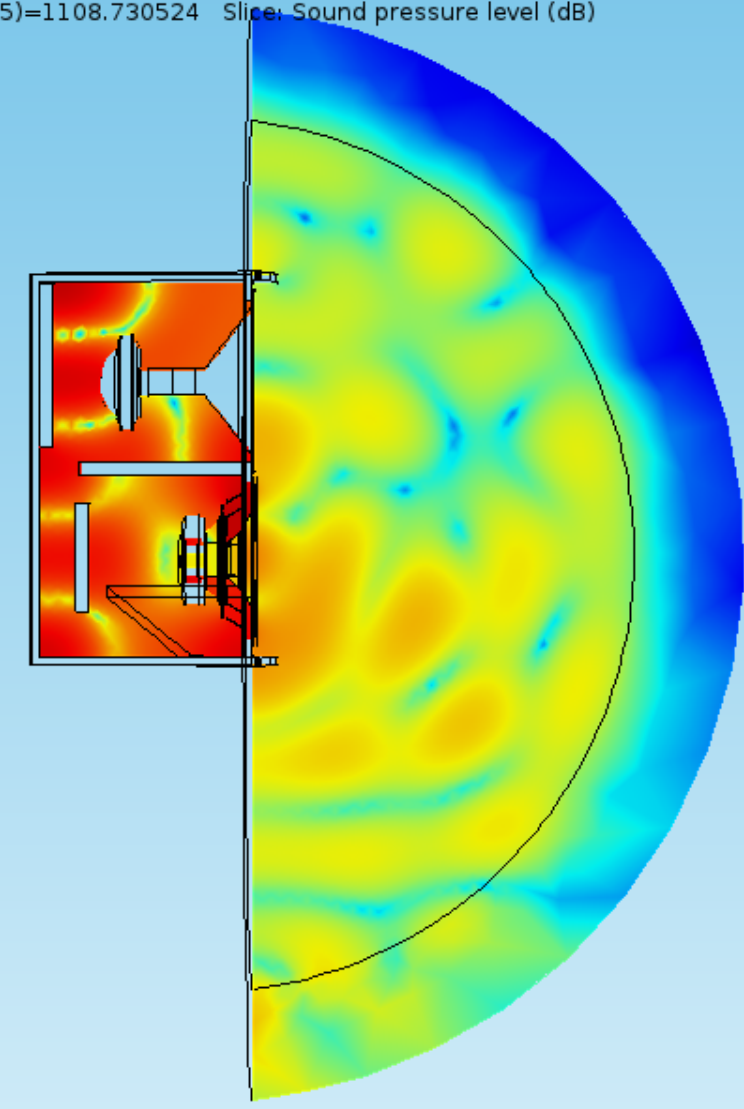
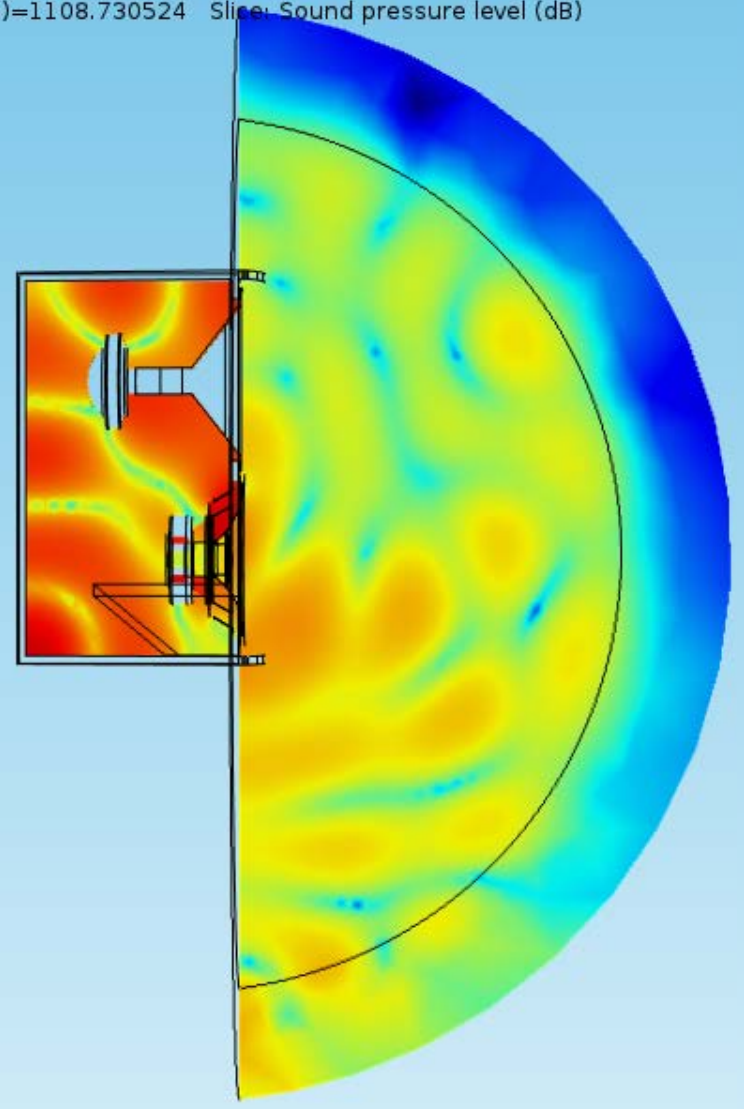
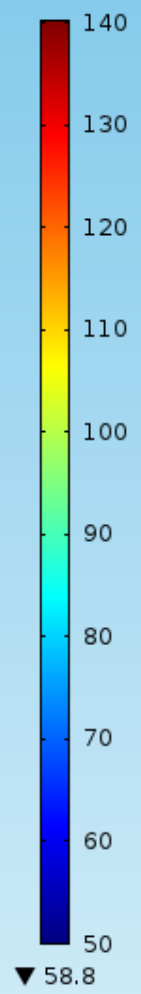
Community Professional Loudspeakers

Comparison between the two models

freq(65)=1108.730524 Slice: Sound pressure level (dB)

freq(65)=1108.730524 Slice: Sound pressure level (dB)

▲ 133



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

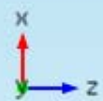
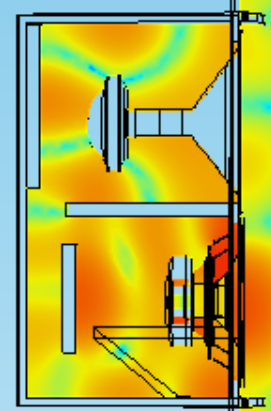
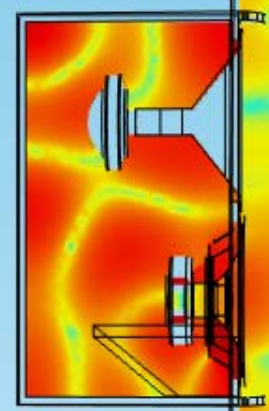
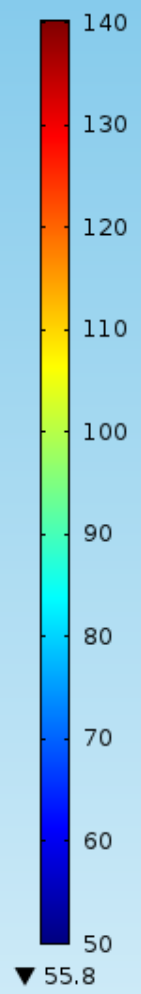
Comparison between the two models



freq(66)=1174.659072 Slice: Sound pressure level (dB)

freq(66)=1174.659072 Slice: Sound pressure level (dB)

▲ 125



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

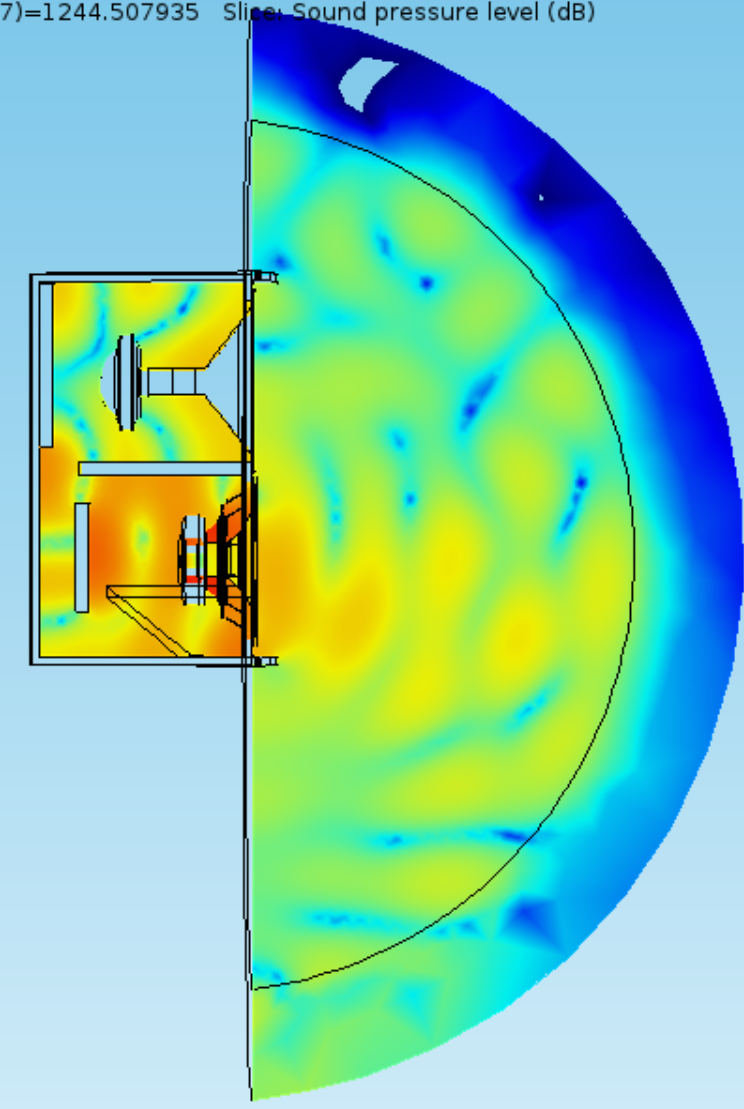
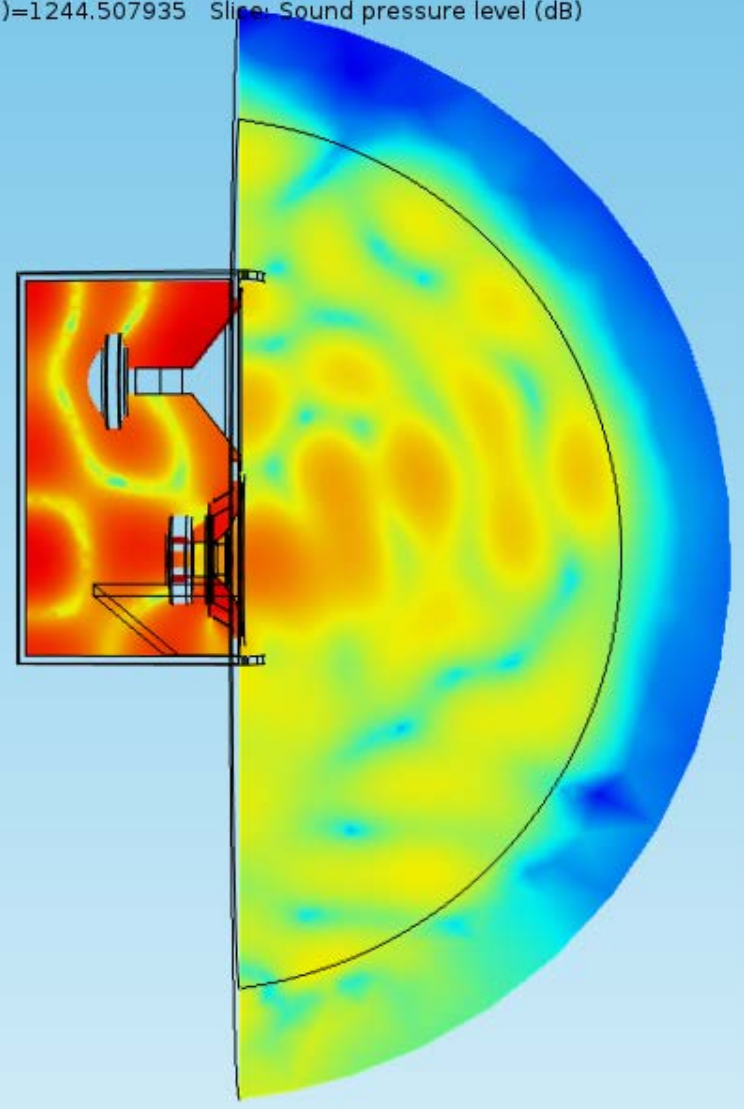
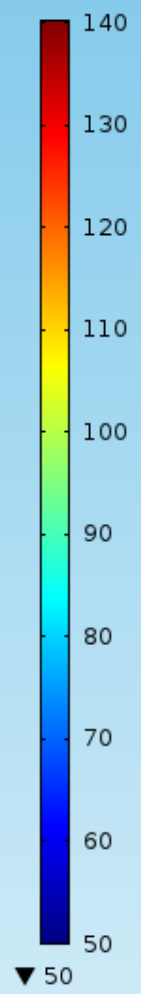
Comparison between the two models

freq(67)=1244.507935 Slice: Sound pressure level (dB)

freq(67)=1244.507935 Slice: Sound pressure level (dB)

COMSOL MULTIPHYSICS

▲ 126



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

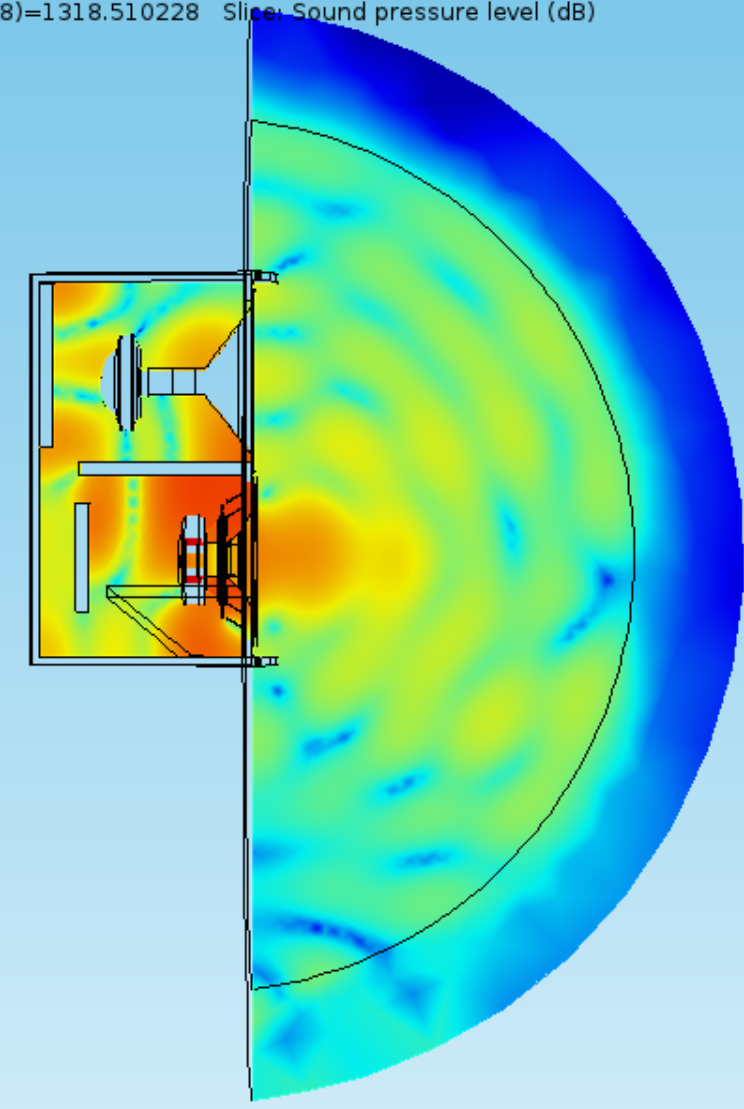
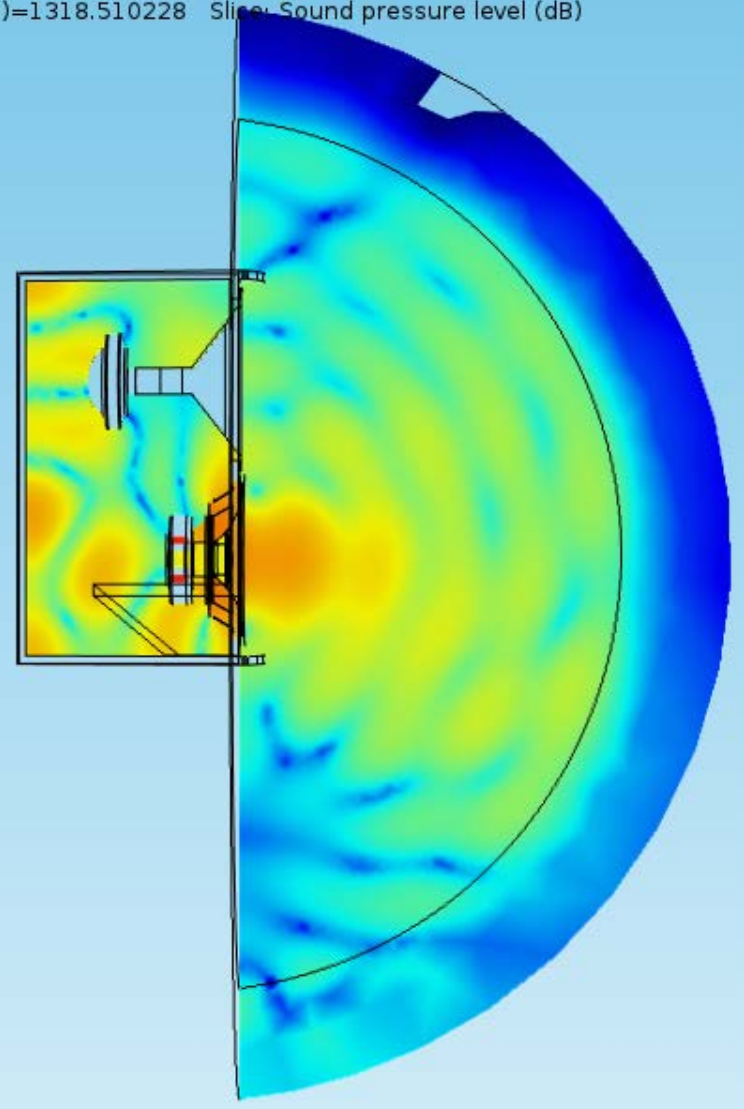
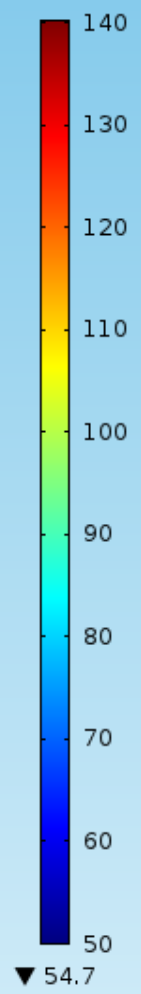
Comparison between the two models



freq(68)=1318.510228 Slice: Sound pressure level (dB)

freq(68)=1318.510228 Slice: Sound pressure level (dB)

▲ 133



Balistreri Riccardo

Loudspeaker Design Engineer

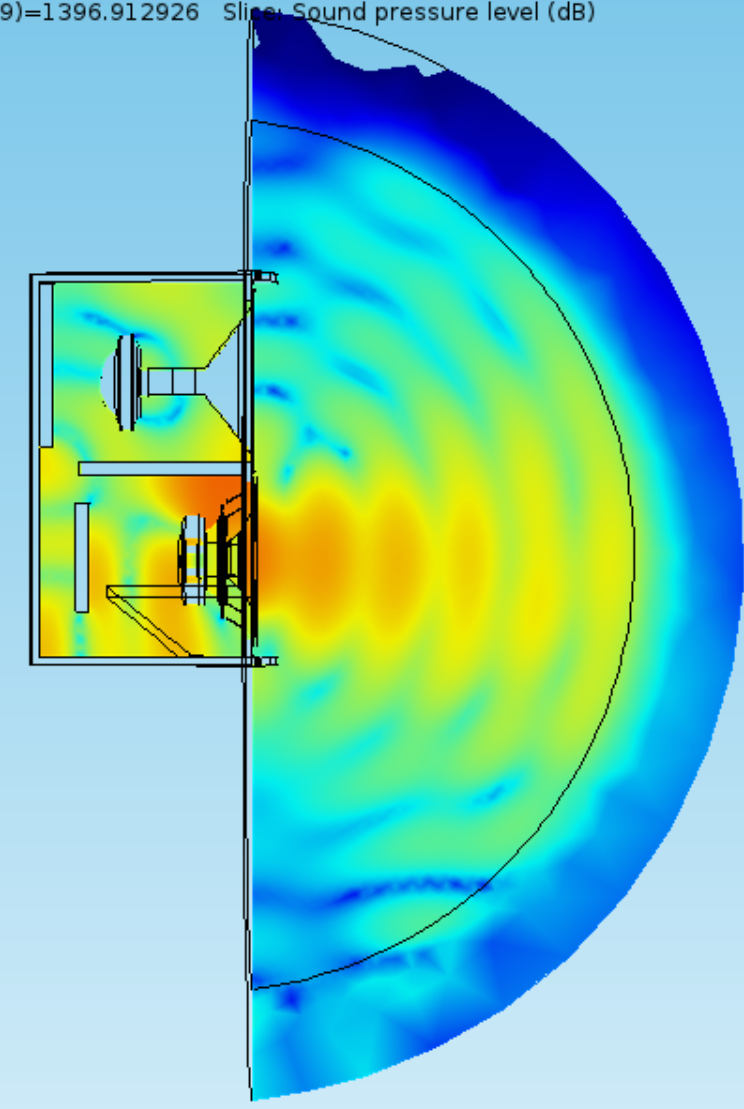
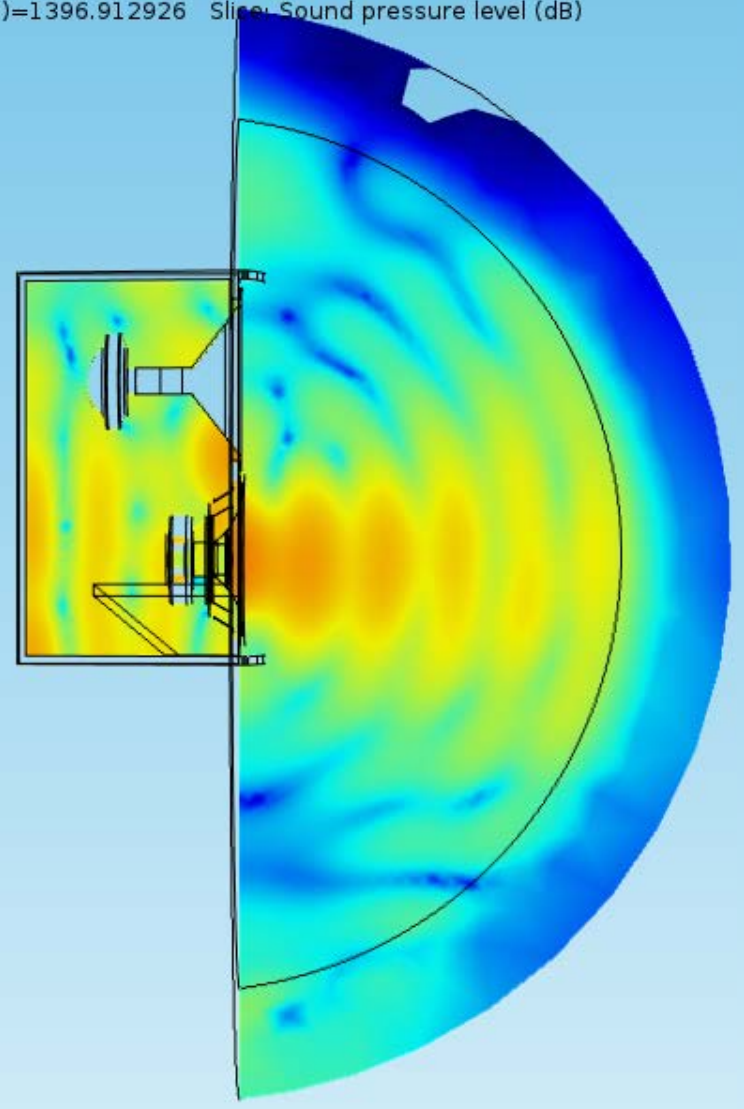
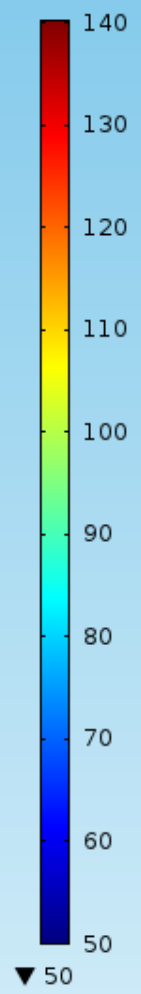
Community Professional Loudspeakers

Comparison between the two models

freq(69)=1396.912926 Slice: Sound pressure level (dB)

freq(69)=1396.912926 Slice: Sound pressure level (dB)

▲ 119



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

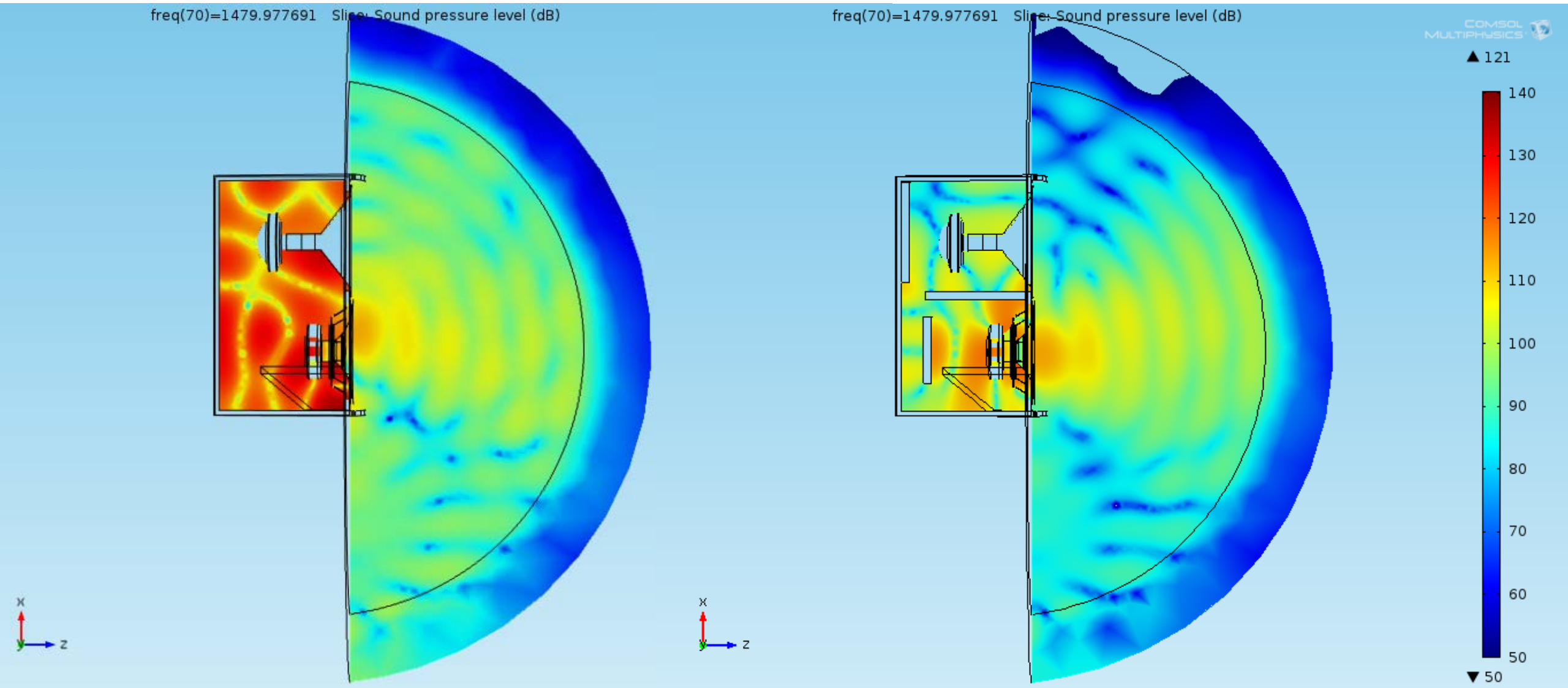
Comparison between the two models



freq(70)=1479.977691 Slice: Sound pressure level (dB)

freq(70)=1479.977691 Slice: Sound pressure level (dB)

COMSOL MULTIPHYSICS



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

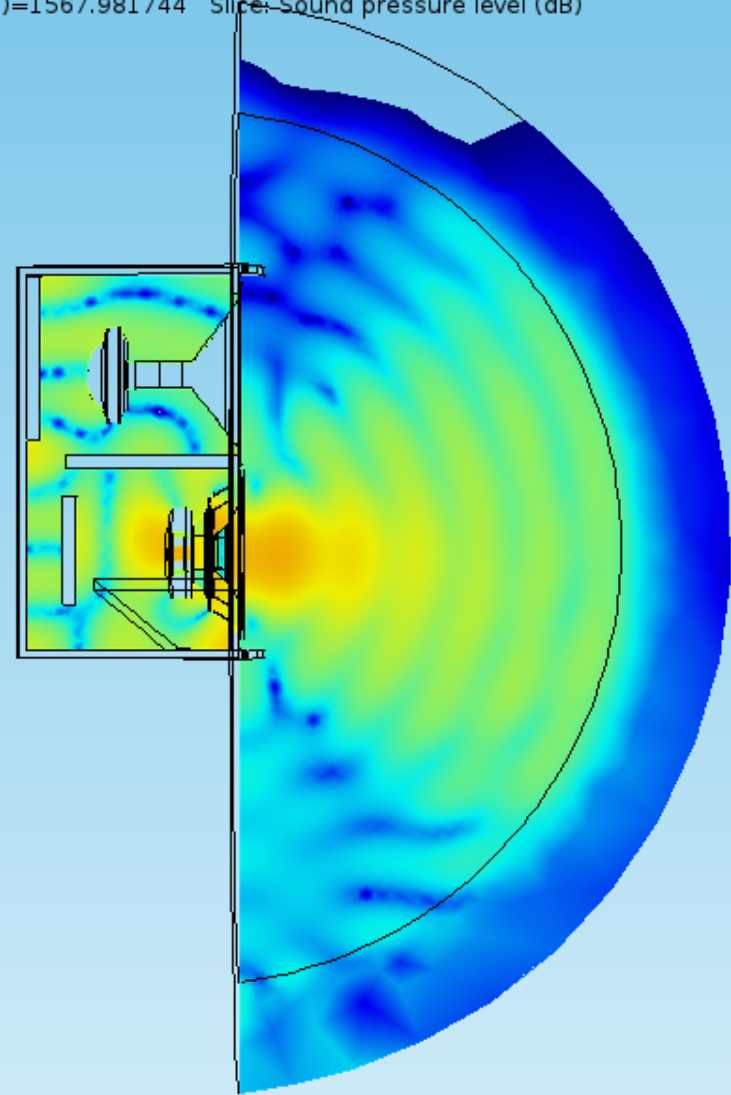
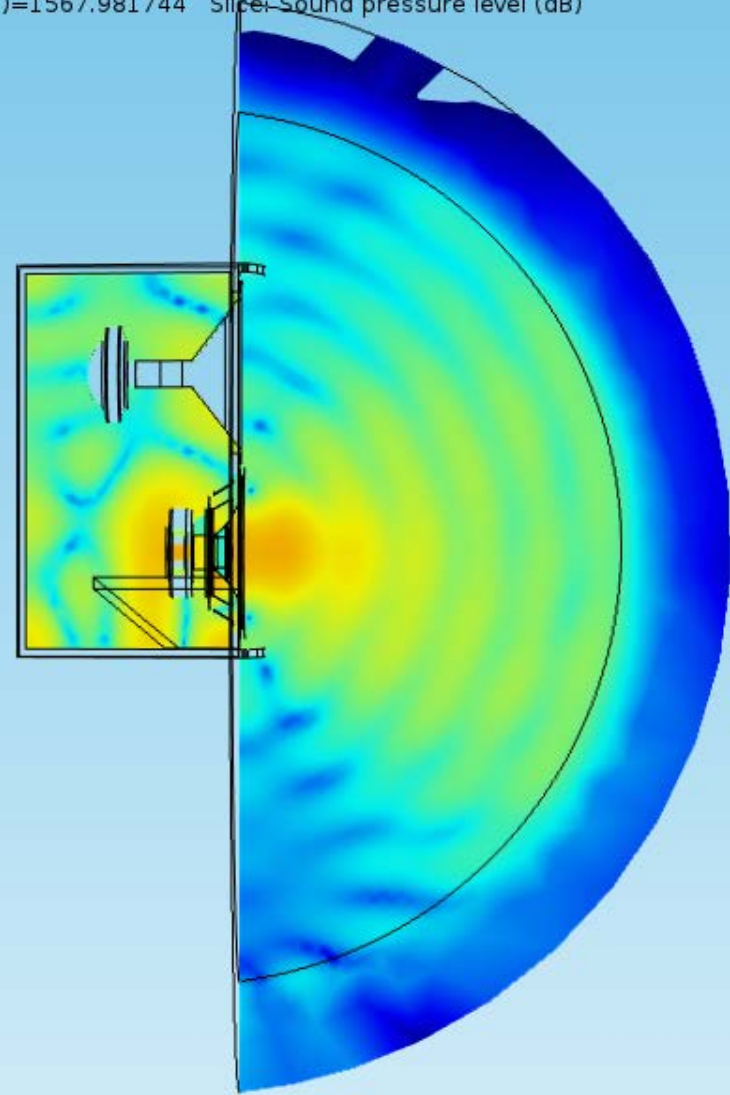
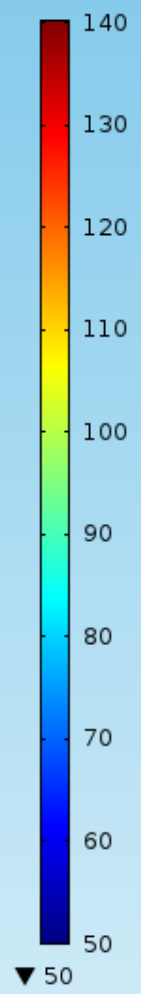
Comparison between the two models



freq(71)=1567.981744 Slice: Sound pressure level (dB)

freq(71)=1567.981744 Slice: Sound pressure level (dB)

▲ 114

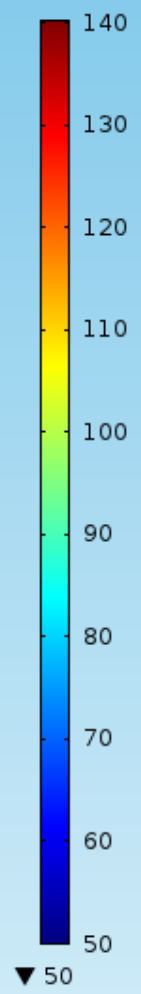


Balistreri Riccardo

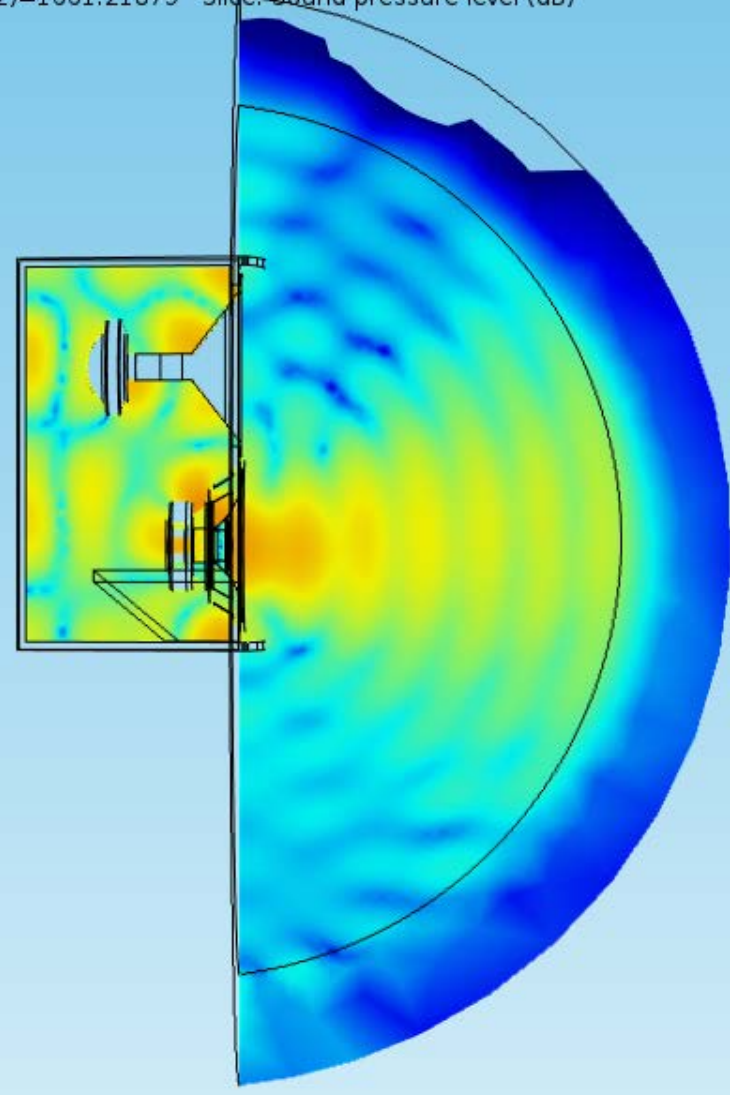
Loudspeaker Design Engineer

Community Professional Loudspeakers

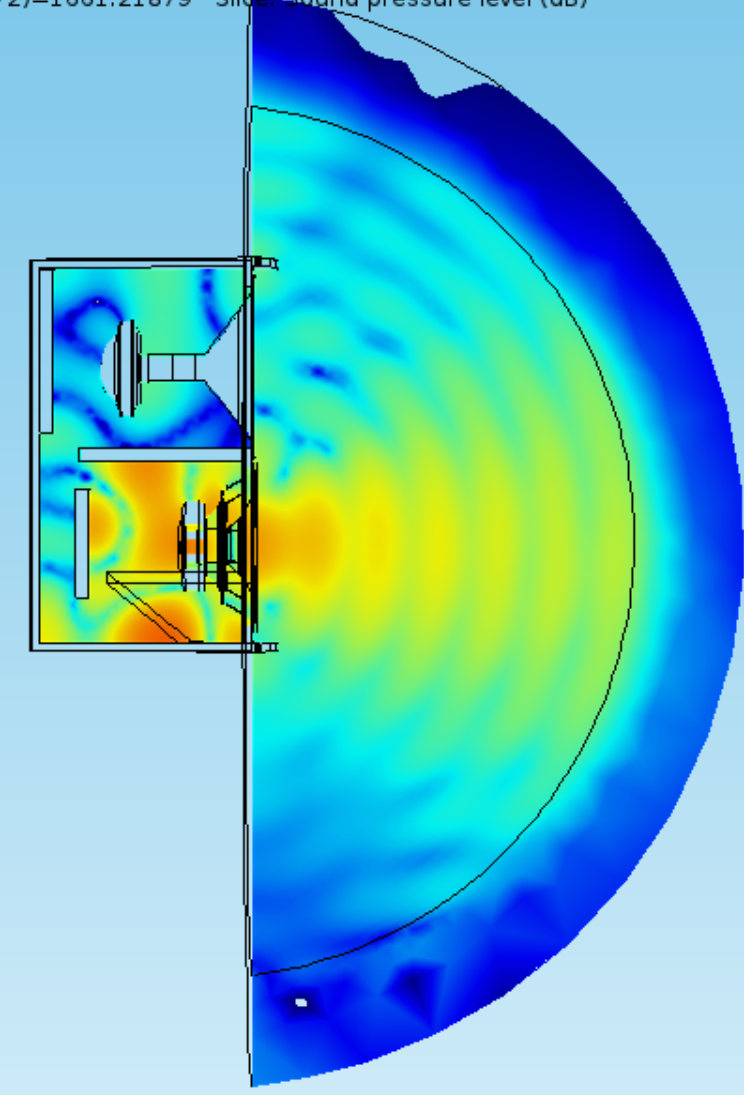
Comparison between the two models



freq(72)=1661.21879 Slice: Sound pressure level (dB)



freq(72)=1661.21879 Slice: Sound pressure level (dB)



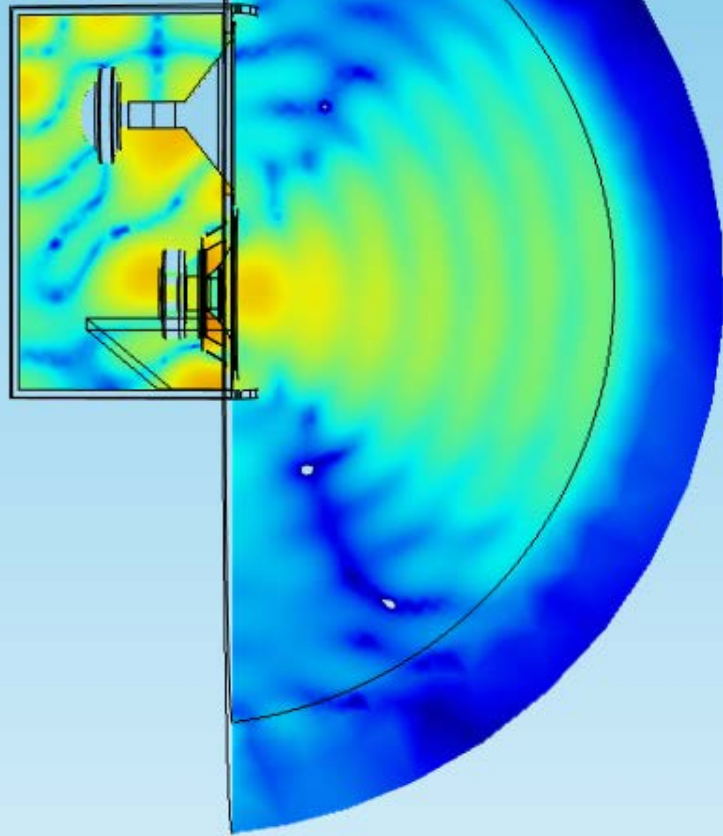
Balistreri Riccardo

Loudspeaker Design Engineer

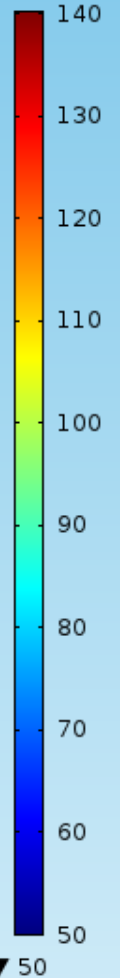
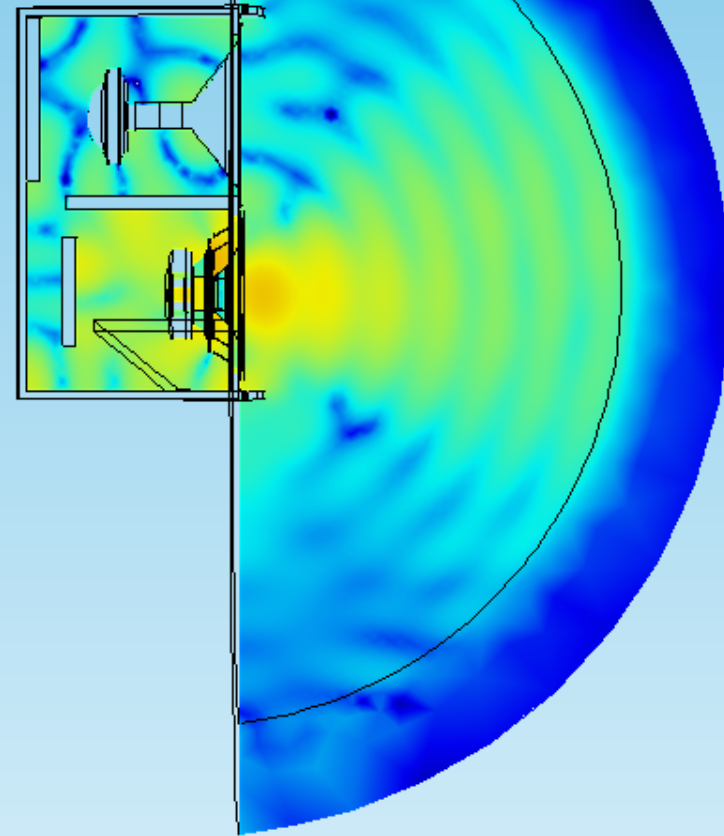
Community Professional Loudspeakers

Comparison between the two models

freq(73)=1760 Slice: Sound pressure level (dB)



freq(73)=1760 Slice: Sound pressure level (dB)



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

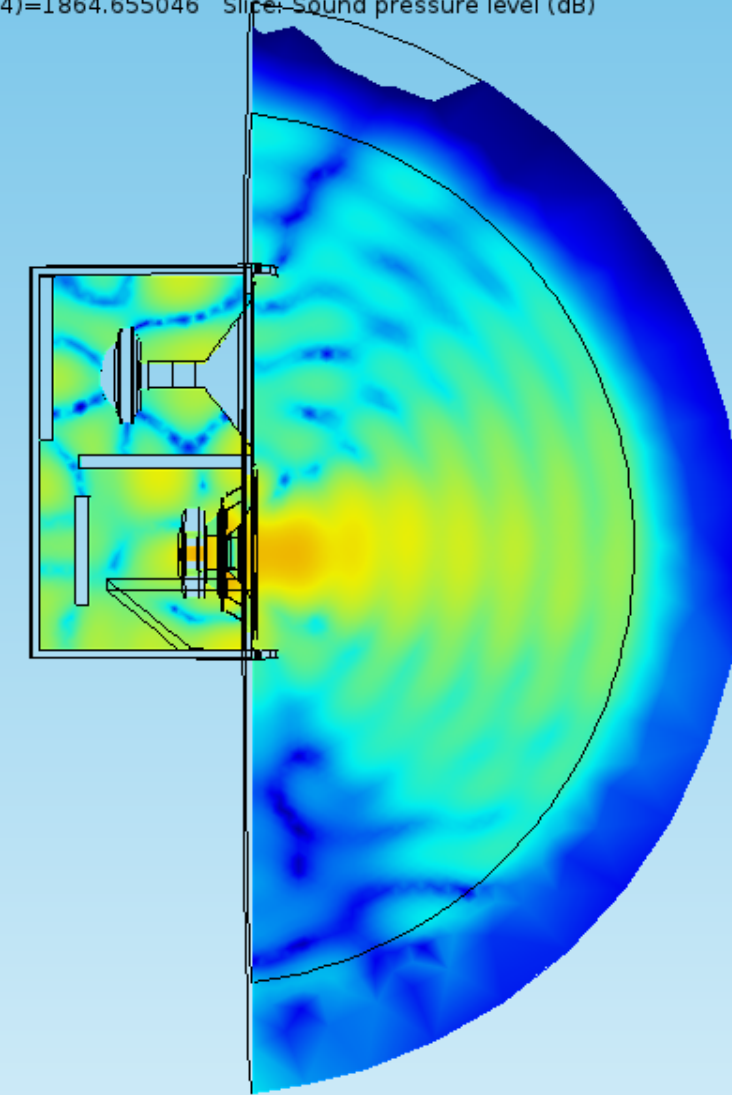
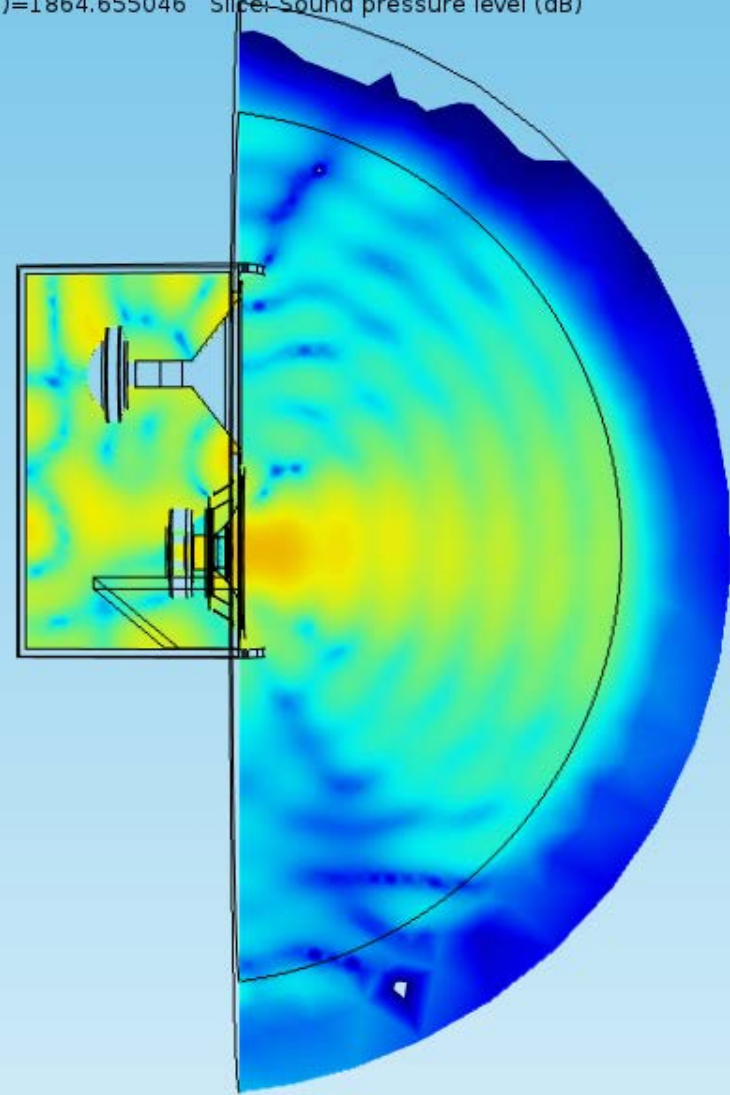
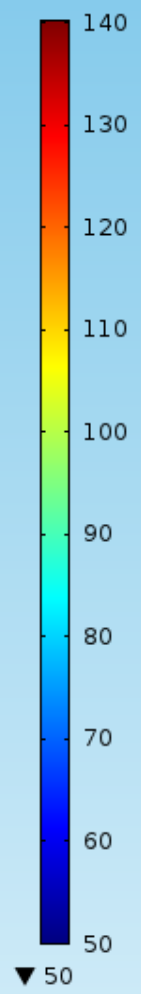
Comparison between the two models



freq(74)=1864.655046 Slice: Sound pressure level (dB)

freq(74)=1864.655046 Slice: Sound pressure level (dB)

▲ 113



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

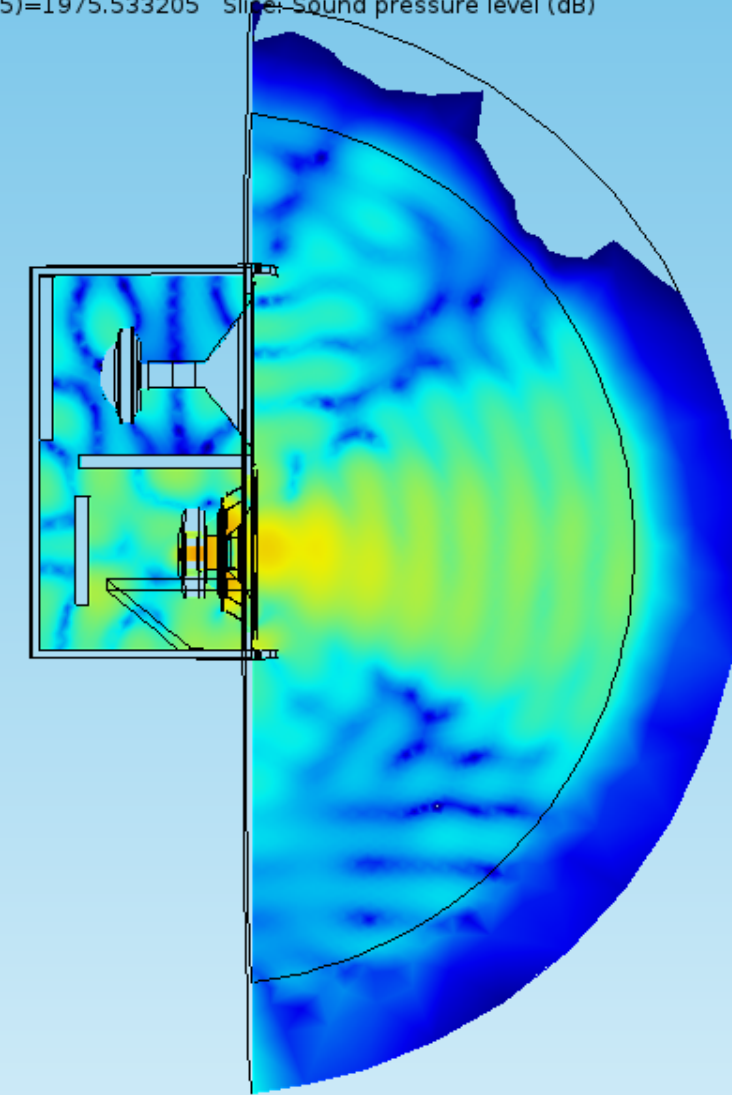
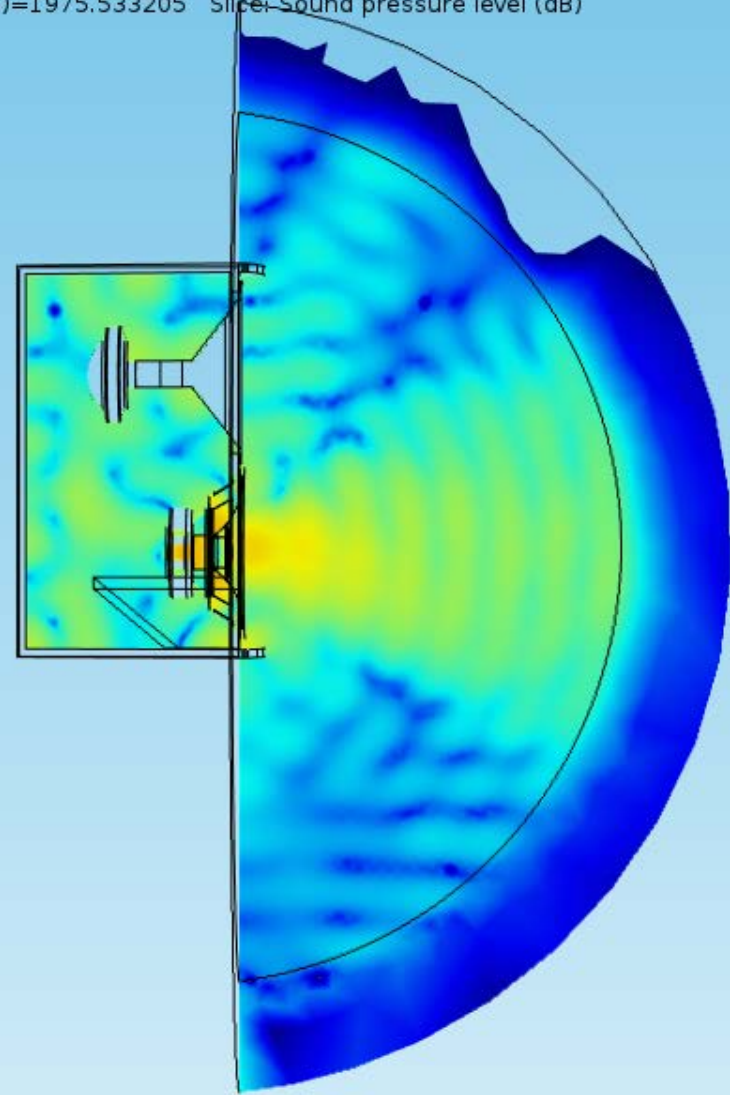
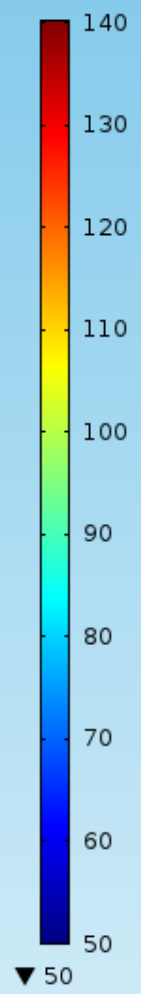
Comparison between the two models

freq(75)=1975.533205 Slice: Sound pressure level (dB)

freq(75)=1975.533205 Slice: Sound pressure level (dB)

COMSOL MULTIPHYSICS

▲ 114



Balistreri Riccardo

Loudspeaker Design Engineer

Community Professional Loudspeakers

Comparison between the two models

