

# Spatial Averaging

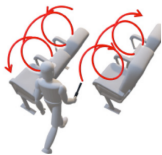
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Floyd Toole:

Spatial-averaging of speaker measurements is critical —single-point measurements are erroneous and meaningless.

From JL Ohl : [Back to pink](#)

## Moving Microphone Measurement



As an introduction, a video is better than any long explanation. Watch this [one](#). Almost all is said about the use of MMM in low to medium frequency.

The incredible aspect of the MMM technique is the return of the pink noise! According to the "Back to pink" paper, the result, even at high frequencies is closed to an anechoic measurement. Incredible!

From [Jean Luc Ohl DIYaudio.com](#) :

As shown at the end of the MMM presentation (Back to pink), the MMM measured response in mid frequencies and up, is very near from anechoic measurements, between what Olive calls listening window (LW) and early reflected curve (ER), (see : A Multiple Regression Model for Predicting Loudspeaker Preference Using Objective Measurements: Part II - Development of the Model) And as he concluded in part 1 of the paper : "The perceived spectral balance strongly correlates with the loudspeaker's measured listening window, giving credence to the importance of the direct sound in timbre perception" By chance, MMM measures something not far from LW "listening window" ! That's why it would be interesting if others could compare MMM to real anechoic measurements. "

Some users' experiences can be find [here](#).

[Here is a tutorial](#) .

[This in french from Dominique Tanguy](#) with a nice short video and all the detail to use REW.

In summary :

- 3 average/s
- 20s measurement time = about 60 averages
- used up to 200Hz, 600Hz, more?
- mic direction : one can read everything! As the mic is generally described by its 0° response curve, pointed it directly at the source could be the best approach.
- mic displacement speed : less than 10cm/s. Seems not so important? Link to HF roll out? See the video
- travelled volume : 60cm
- with REW: overlap max (93.75%) and update interval of 4
- adjust the volume for a sound at least 20dB above the noise floor

## Other tools

### Making several IR measurements

One can find in different readings to make 9 to 10 measurements distant enough (? up to 1m?) to extract an average.

### Coneq

The commercial Coneq tool proceeds a bit differently - something in between

Here is a [short video introduction](#)