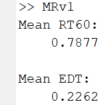
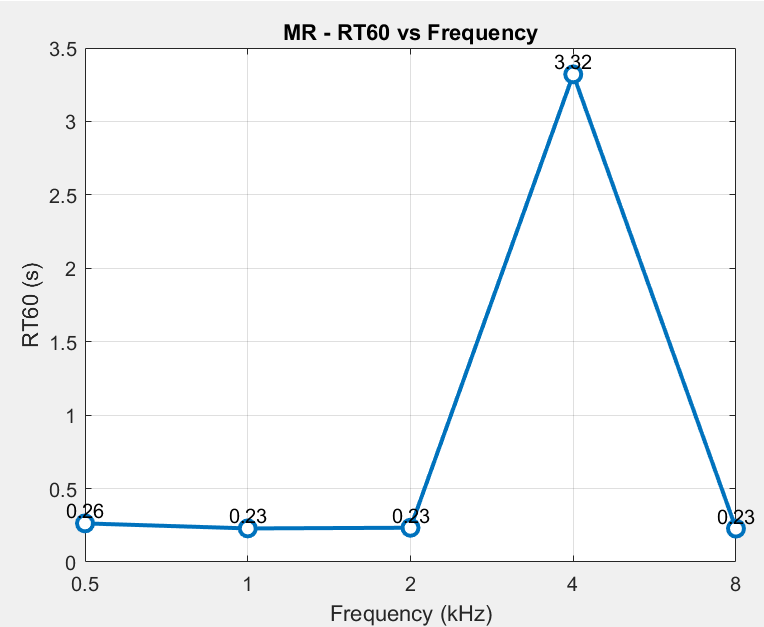
legends: Orange (Medium Priority), Red (Critical/High Priority), Blue (Info), Green (Good work!)

Done, Important

# Monday, 05 August 2024

OK just realised that to show the hypothesis that the results might just be coincidence due to octave band energy curve and not accurate, I should’ve had the energy curve saved as well. So let’s save those as well into a folder named ResultsV1 in Atiyed-Matlab folder. Also, to make it easier to compare with the Kim21, let’s follow the order its using as well. Added lines in matlab script to compared the RT60 in octave bands as well as created separated script for each scene results (less commenting/uncommenting)

## MR result v1



Uses RT42.5

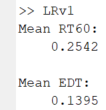
0.5 volume , physics based attenuation, 1:1 direct to reflections mix

## KT result v1

Uses RT60

0.01 volume level, physics based attenuation, 1:1 direct to reflections mix

## LR result v1



Uses RT30, decay\_range value in irStats.m divided by 2 for EDT.

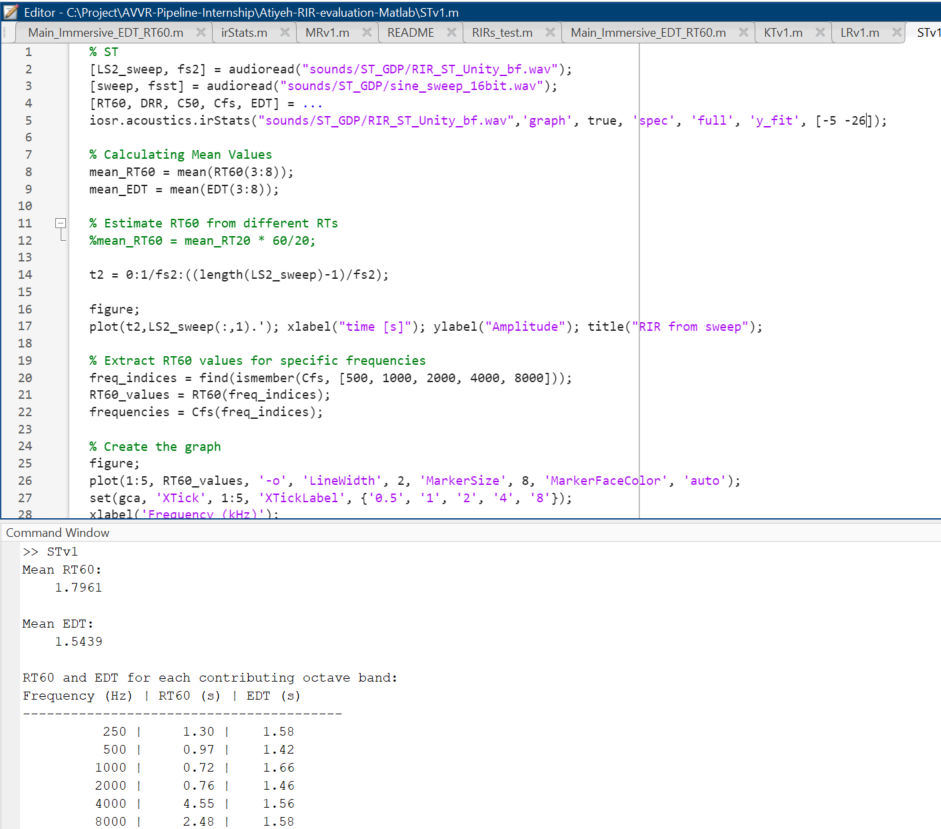
0.01 volume level, physics based attenuation, 1:1 direct to reflections mix

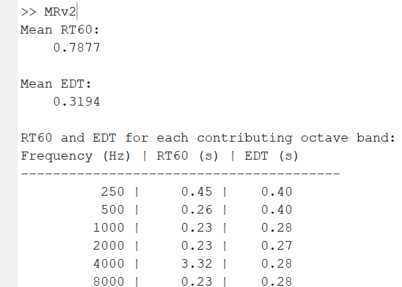
## ST result v1

## BIG FINDINGS/CHANGES



Reverted back irStats.m to usual, because im stupid and don’t understand code properly, it supposed to be 60 because that is the scaling/extrapolation, its already done… this also makes it easier to trial and error y\_fit as only need to change 1 line instead.

Also added the table to see RT60 and EDT for each bands more clearly..

Lets redo everything!

## MR result v2

Uses y\_fit = 42.5 / RT42.5  
0.5 volume , physics based attenuation, 1:1 direct to reflections mix

## KT result v2

Uses RT60  
0.01 volume level, physics based attenuation, 1:1 direct to reflections mix

## LR result v2

Uses RT30, as we no longer modify irStats.m, the EDT is very wrong.

* 1. volume level, physics based attenuation, 1:1 direct to reflections mix
  2. and EDT cant be fixed by reducing volume either as it is in lowest volume…

## ST result v2

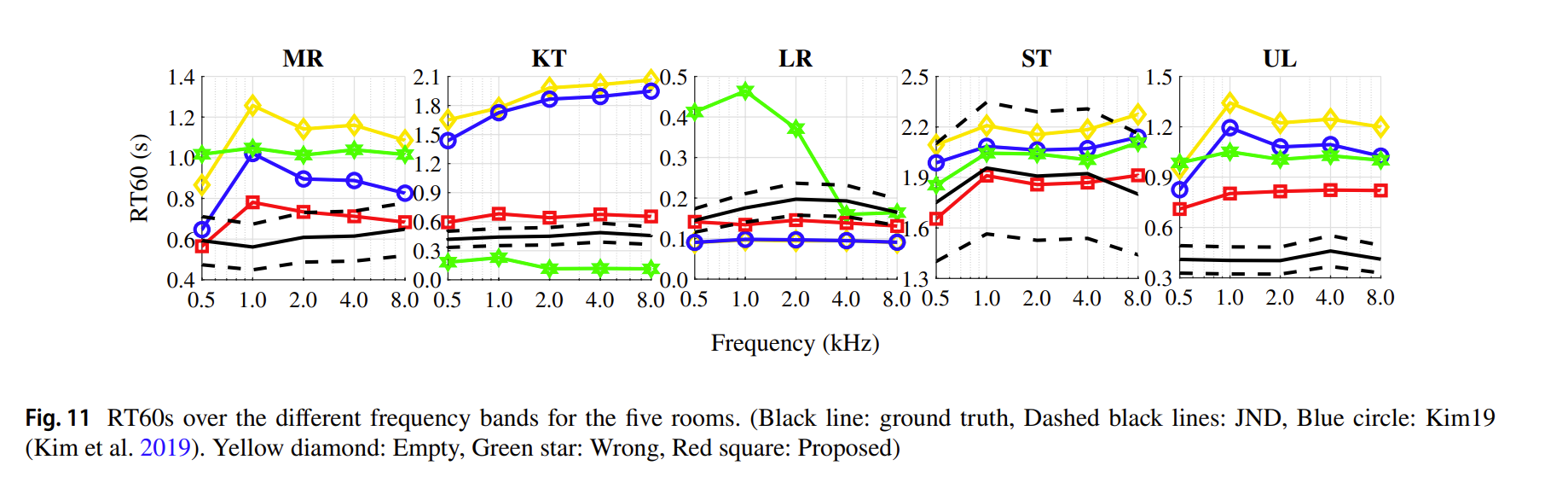
Uses y\_fit = 26 / RT26 …. Idk man.

0.5 volume level, physics based attenuation, 0.5:5 direct to reflection mix.

## UL result v2

Uses y\_fit = 36 / RT36 …

0.5 volume level, physics based attenuation, 1:1 direct to reflection mix.

As seen from all above graphs, this is obviously not correct as its not slightly balanced at all on all octave bands compared to Kim21 result [28VR.pdf (3dkim.com)](http://www.3dkim.com/Eng/papers/28VR.pdf)

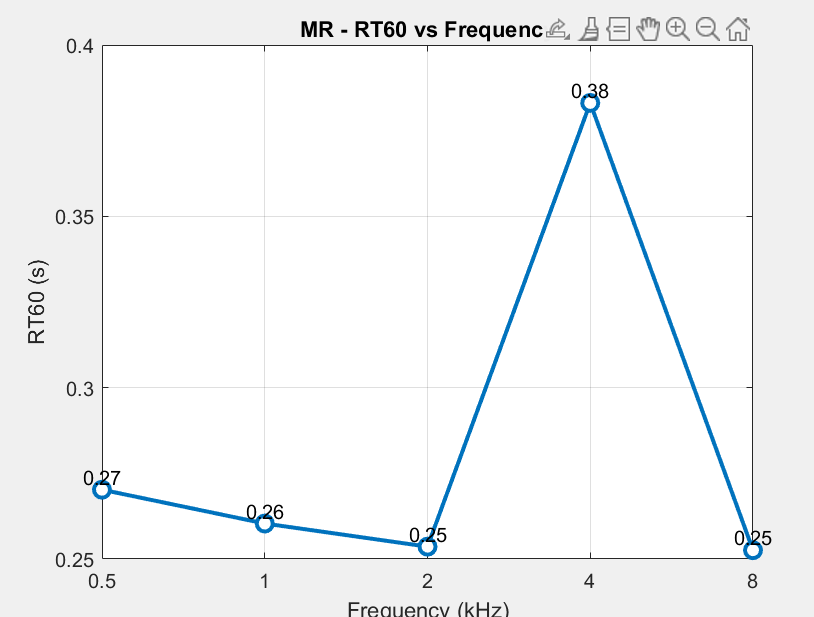
Interestingly enough, latest 2022 paper ([29EUSIPCO.pdf (3dkim.com)](http://www.3dkim.com/Eng/papers/29EUSIPCO.pdf)) doesn’t have the graph for each octave band in the paper which makes it more suspect…

This problem also is not isolated to only my mesh/result but Mona’s latest audio that I have as seen below.

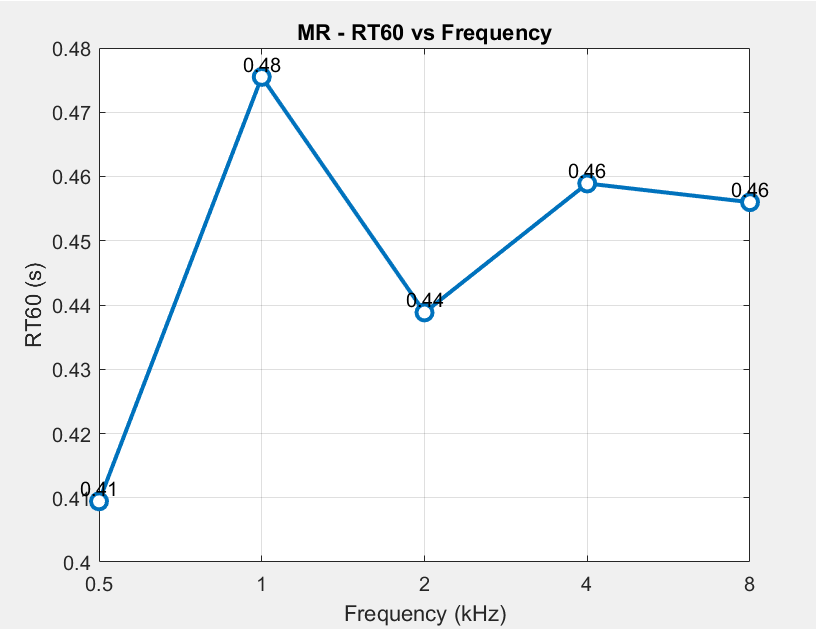
## Mona’s ST

Ignore the MR title on graph..

## Mona’s MR

As seen from ST and MR, this doesn’t look right…

## Mona’s KT

Interestingly though, it looks pretty right for KT for some reason.

## Mona’s UL

## Verdict:

Theory right now is either a limitation in the way audio is recorded or the audio source itself (sine sweep), as in S3A, it seems evaluation scene uses sine ‘sweep-repeat’ instead, but I have no idea how to deconvolve or the correct way to record it because it is looping as well…

# Tuesday, 6 August 2024

Meeting prep.

## Work summarised:

* Conducted extensive troubleshooting of EDT/RT60 analysis issues across all scenes, including experimenting with various audio settings, Steam Audio parameters, and MATLAB code modifications.
* Refined and standardized the audio evaluation process, creating separate scripts for each scene, adjusting parameters individually, and improving result presentation for easier comparison with Kim21 data.

## Problem encountered:

* Identified persistent inconsistencies in octave band results compared to Kim21, analyzed Mona's latest audio results, and theorized potential limitations in recording methods or audio source as causes for discrepancies.
* Not having Kim21’s audio files (RIRs) & Mona’s Unity files makes it very hard for comparison and sanity check.

## Plans for next week:

No clue, TBD during meeting, very stuck rn.

* Find a way to record sounds directly through Unity instead of 3rd party apps.
* If still doesn’t work, email Dr to contact Atiyeh for more help.

If result is okay and can proceed, continue with plan on Week 5.

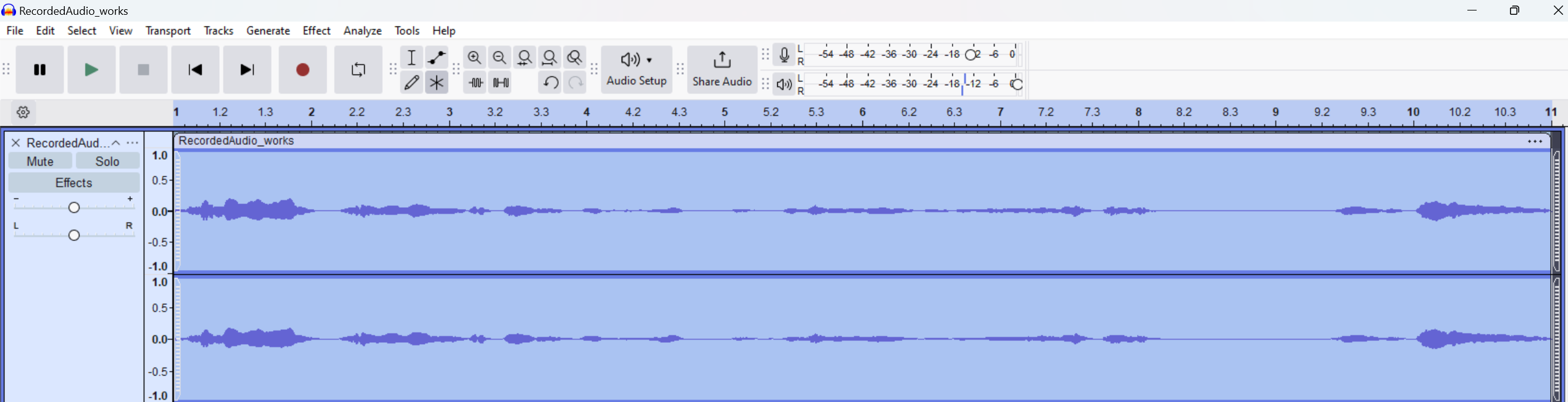
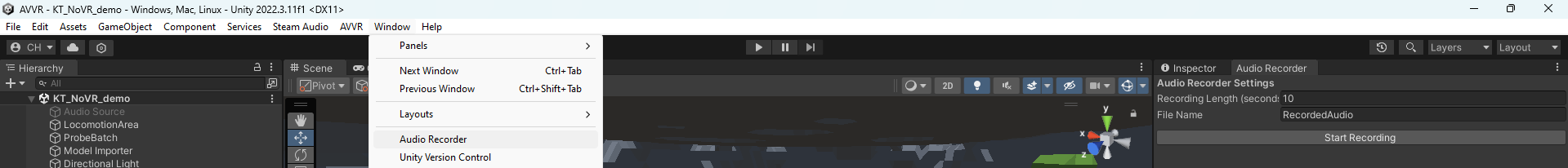
Question to ask (for confirmation/elimination of anomalies):

1. How is audio recorded on Kim21? External apps like audacity/obs? Nope, record directly
2. Is there ceiling? (a bit stupid but could be because the mesh in GDP and voxel in Kim21/Mona’s is different? Should I email Mona to ask for her unity project files so I can reproduce her result for my sanity check?) Yes ceiling a must!
3. Unrelated but did Dr Hansung get my timesheet for uniworkforce pay claim and submitted it yet? Yes!

No meeting next week, meeting next 2 week instead.

Post meeting: In hindsight, maybe I should’ve tried internal Unity recording straight away instead of using Audacity/WavePad like Mona suggested. Because if trash in (audio file), trash out for analysis obviously.

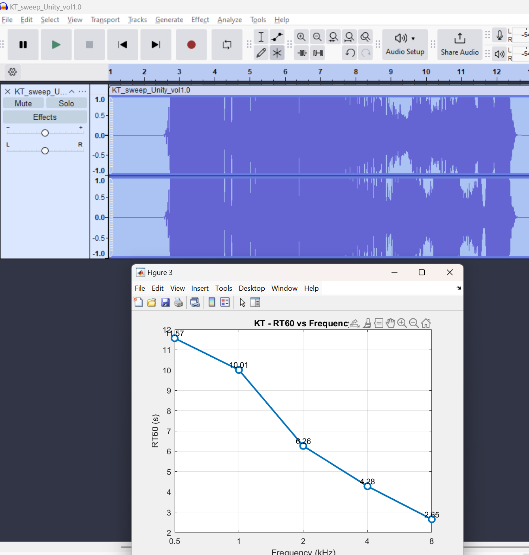
Implementing direct audio capture/recording in Unity, but not fruitful yet. OK, works but for some reason it cuts off at 4 second max.

FIXED IT! Audio capture directly from Unity works now thanks to AudioCapture.cs and AudioRecorder.cs, Go to window -> Audio Recorder to use it 

Tomorrow lets try this on the sine sweep for RIR, finger crossed this fixes the problem… If not lets email Dr Hansung Kim my finding.

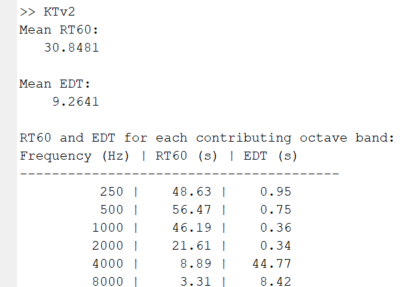
# Wednesday, 07 August 2024

BIG W, tested recording without headphone/volume mixer muted and the resulting recording still sounds as expected! No longer will need to risk damaging my headphone with crazy sine sweep, and can test without making annoying sound to everyone else near me (because sine sweep is loud and annoying).

Interesting, in KT, using vol0.1 result into RT60 around 0.28 with peaks still on 8kHz, but using vol1.0 causes the audio to clip and absurdly high RT60, lets try 0.5

OK vol 0.5 still have clipping on lower frequency still, lets use 0.25. Hmm, it still clips on 0.25 at lower freq, lets do 0.13 as S3A then.

Ok it still clips a little but much better bands, but I still think 0.1 is the best for non clipping. So lets use that and modify reflections mix level to 5 from 1. Keeping direct mix at 1.

Nvm, it makes things worse. Im just gonna trial and error until I get good result at this point ngl.

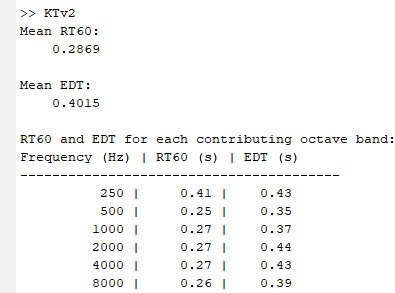
I have no clue what is causing the issue, ngl might as well try gunshot and different sine sweep just to be sure. This means I need to rewrite some part of analysis .ipynb so will do that tomorrow instead.

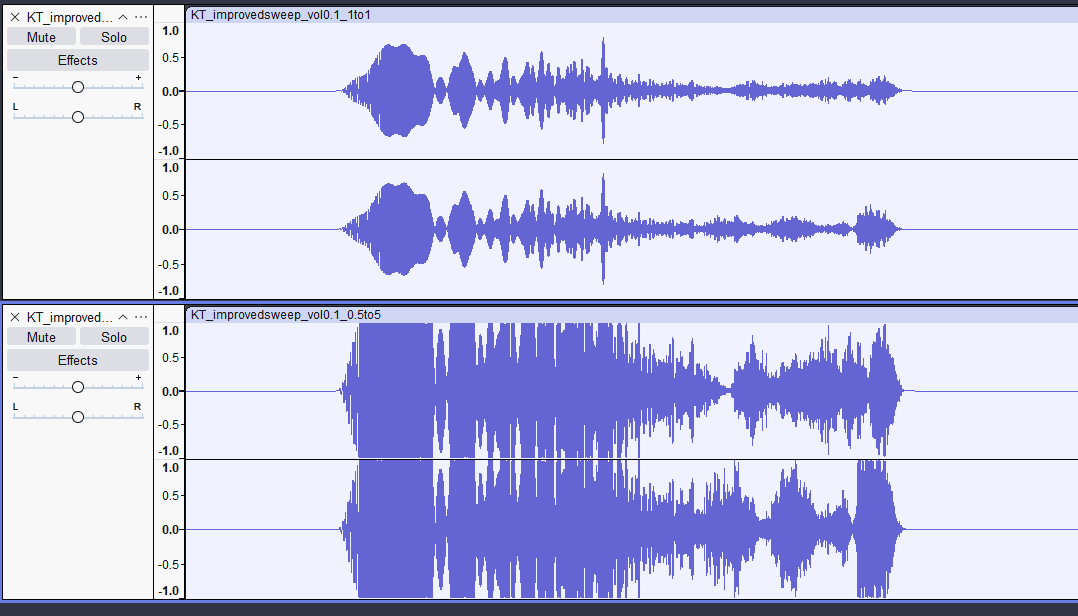
# Thursday, 08 August 2024

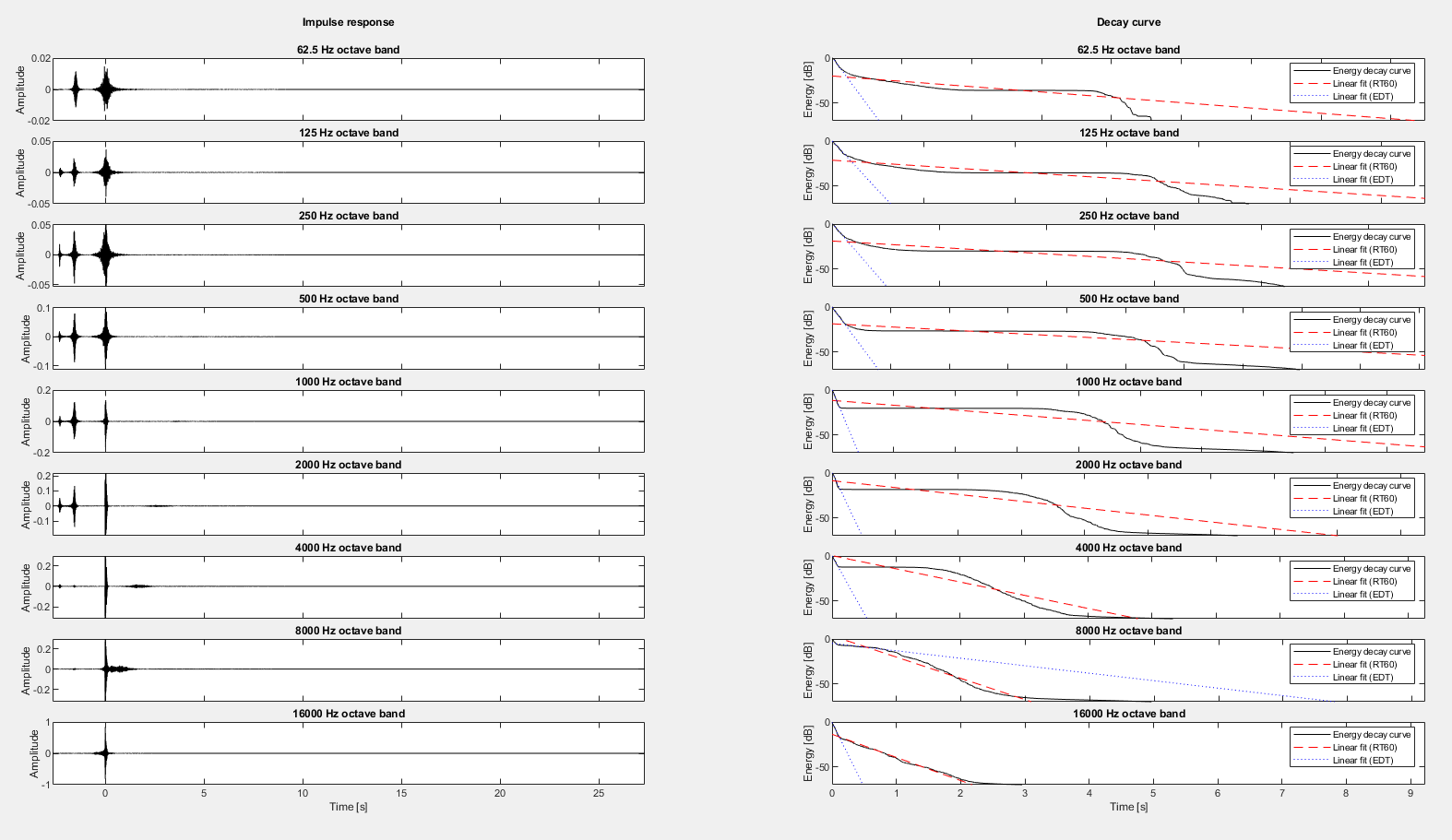
WFH, did some reading and research on sine sweep RIR methods. Found some useful video for references and learning [1: Introduction to Room Acoustics (youtube.com)](https://www.youtube.com/watch?v=6Q0joik6E74&list=PLiZaccpD4XoLywgMwl55N2h3cB3hKxZmj), [Acoustic measurements with the sine sweep method (youtube.com)](https://www.youtube.com/watch?v=azyrnyeoRkA), [Sine sweep optimization for room impulse response measurements (youtube.com)](https://www.youtube.com/watch?v=sD8hrVots2Q).

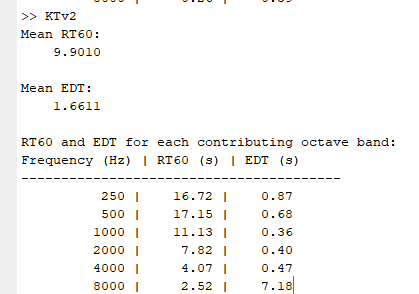
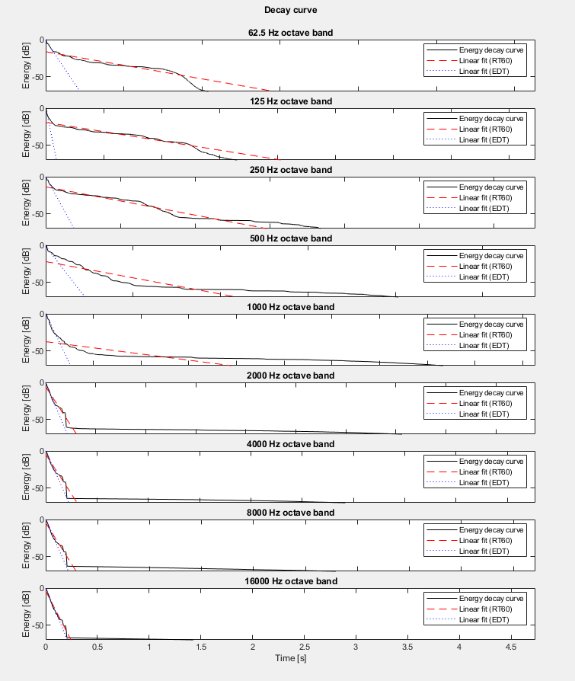
# Friday, 09 August 2024

Another WFH, start rewriting RIR\_Analysis code to try use different sine sweep signal.

created new improved sine sweep gen and deconvolve code in ipynb (no more weird noise floor but still too low rt60 on 1to1 on 0.1 vol for KT. Overall a good progress imo. Lets see if changing to 0.5 to 5 ratio does anything. Keeping at 0.1 vol to not clip the sound.

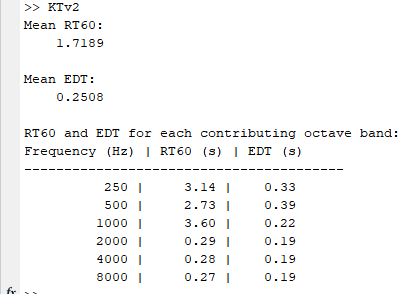
NVM, I think it clips due to high reverb still? Interesting… 

OK, I think the distortion on the left is due to clipping, and 5 reflections mix is obviously too high as seen above.

But hey, good silver lining is that now all octave bands is going as expected instead of only 1 band showing proper response.  
  
Next, lets try 1 to 2 ratio.

Nvm, as seen on the right, it still have high RT60 on lower frequencies, but too low on higher frequencies hmmm

I think manual correction of each octave band is needed.. but for now lets try using smaller y\_fit like RT30.

It don’t really works either.. Oh well, will continue next week.