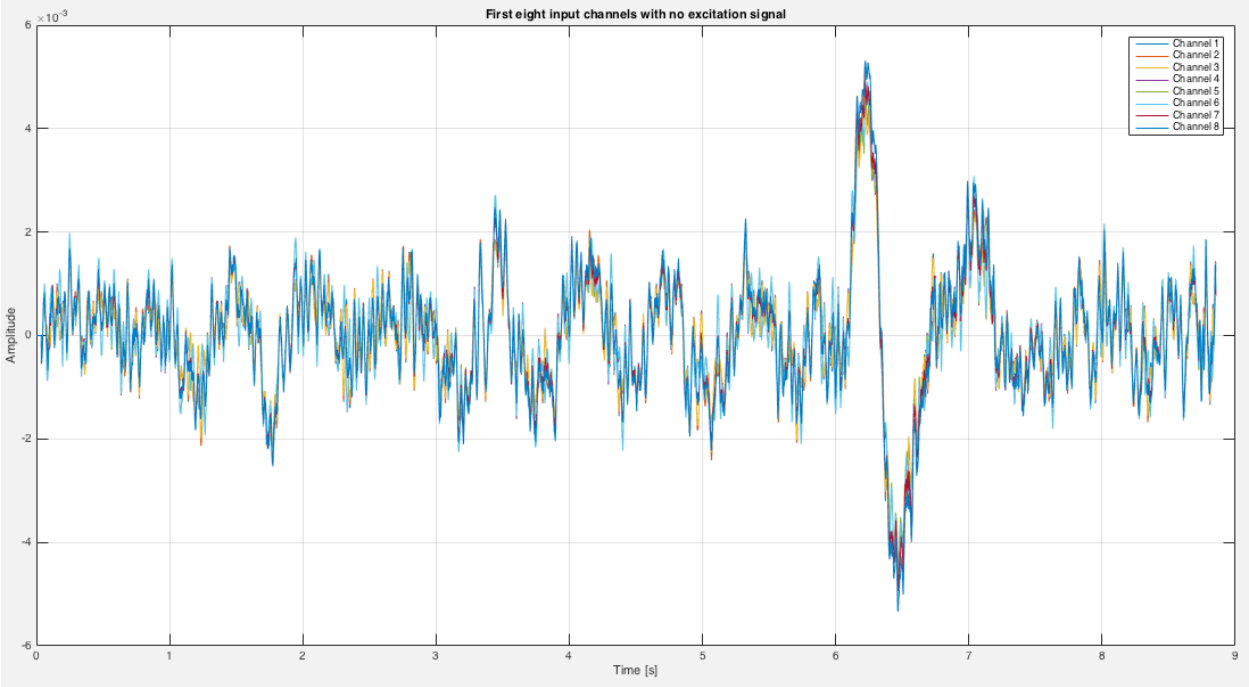
1 - Background noise

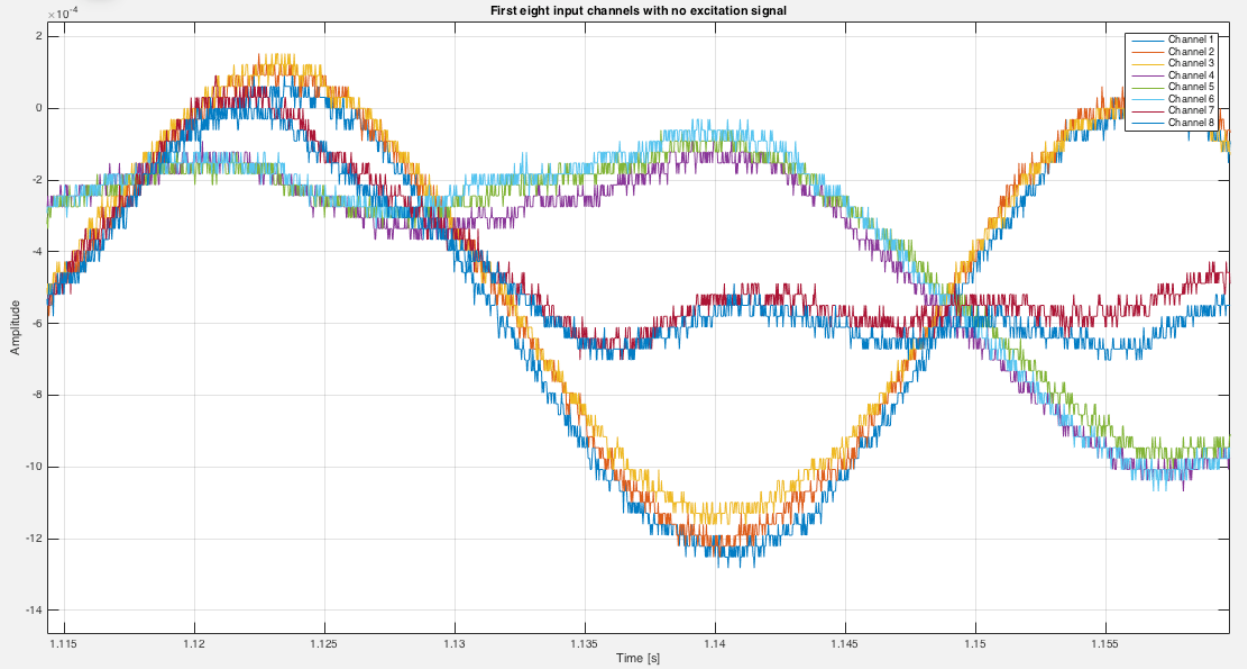


This plot shows the first eight input channels (all with microphones connected). Recorded for several seconds with no excitation applied.

Things to mention:

- all eight signals are very correlated —> acoustic noise
- the signals seem to have a low autocorrelation —> it's not electrical noise
- noise energy is concentrated on low frequency

2 - Background noise (ZOOM)

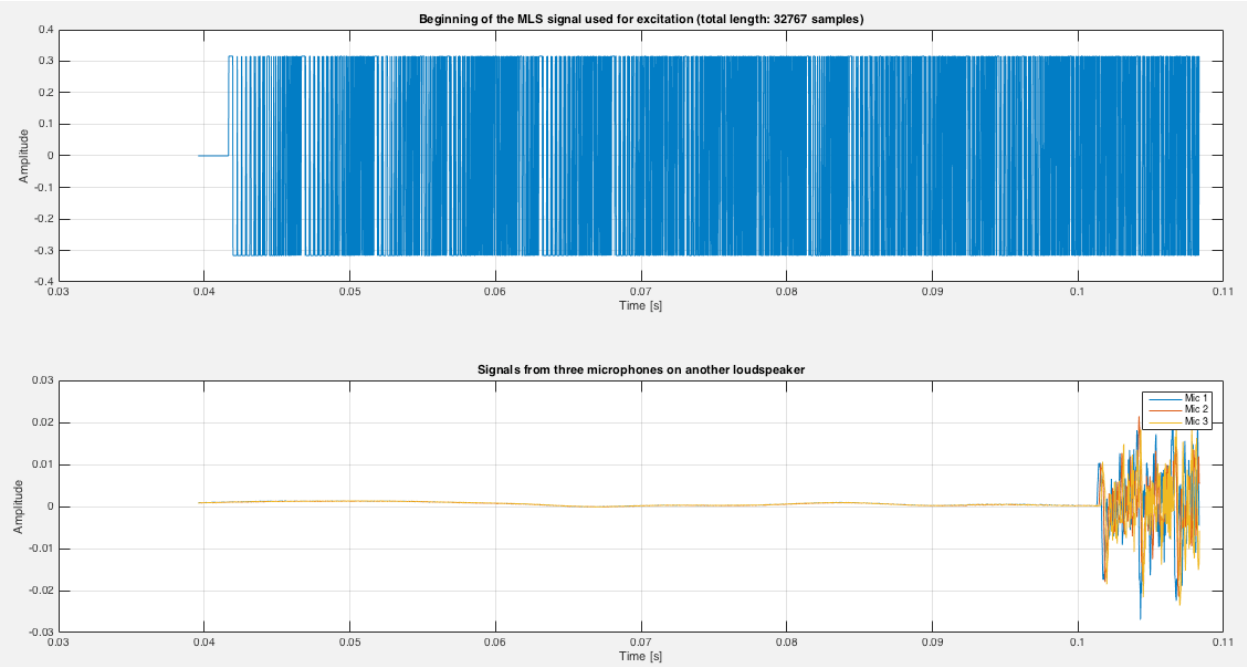


This is just a zoom of the background noise of those eight input channels.

Things to mention:

- the signals seem to be specially correlated in groups, that match the groups of microphones on the same loudspeaker. So, seems that the three mics from each loudspeaker get the same noise, so it must be acoustical.

3 - MLS excitation signal and recording

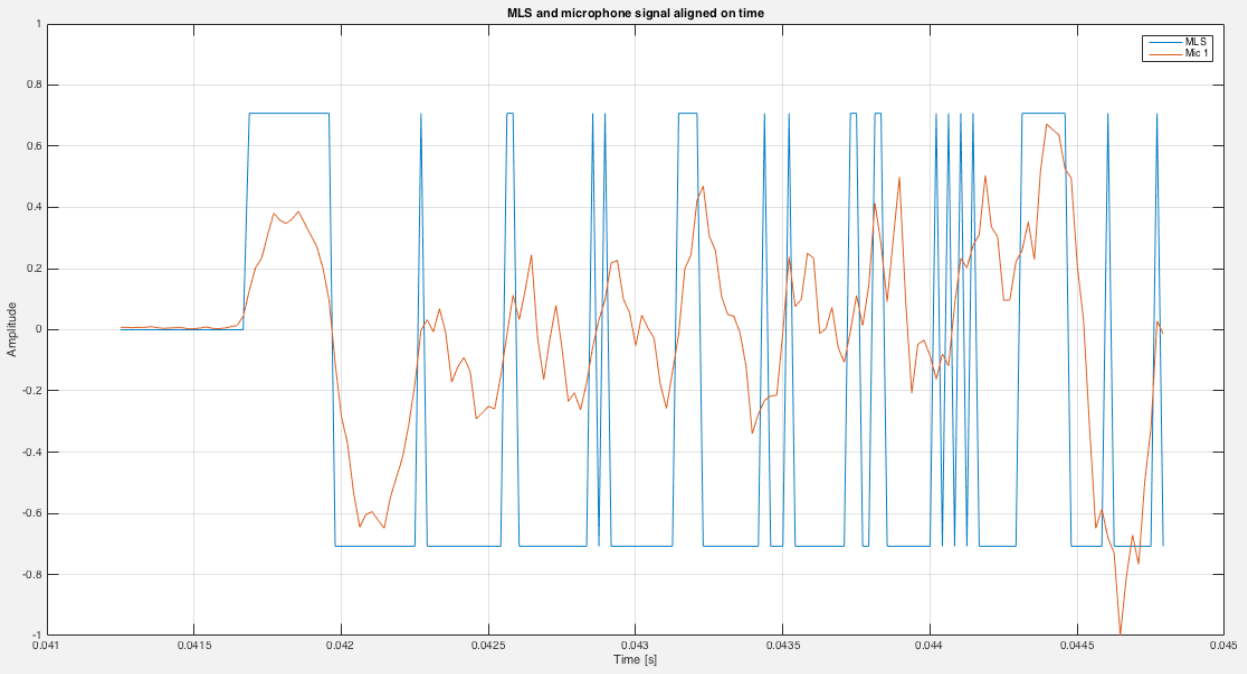


In the top plot you can see the MLS sequence transmitted to a loudspeaker (loudspeaker L). In the bottom plot there are three traces corresponding to the three microphones on loudspeaker C. There is an initial delay due to two factors: delay on the acquisition system and acoustical delay for traveling the distance between loudspeakers. The first one will be compensated after deconvolving with the response of the channel connected “in loop”.

Things to mention:

- the signal to noise ratio seems acceptable by looking at the bottom plot. It is true, though, that the amplitude is not fulfilling the scale (it’s around 0.02 peak that is ≈ -37dBFS) but it’s for a reason: to accommodate the much larger input signal when their own loudspeaker is transmitting. If that’s not enough, we can always increase the level and then forget about the recordings of their own loudspeaker (not needed on the other hand) but the possible distortion is prone to cause more defects on the adjacent channels due to crosstalk (specially exaggerated with distortion).

4 - MLS and microphone signal aligned

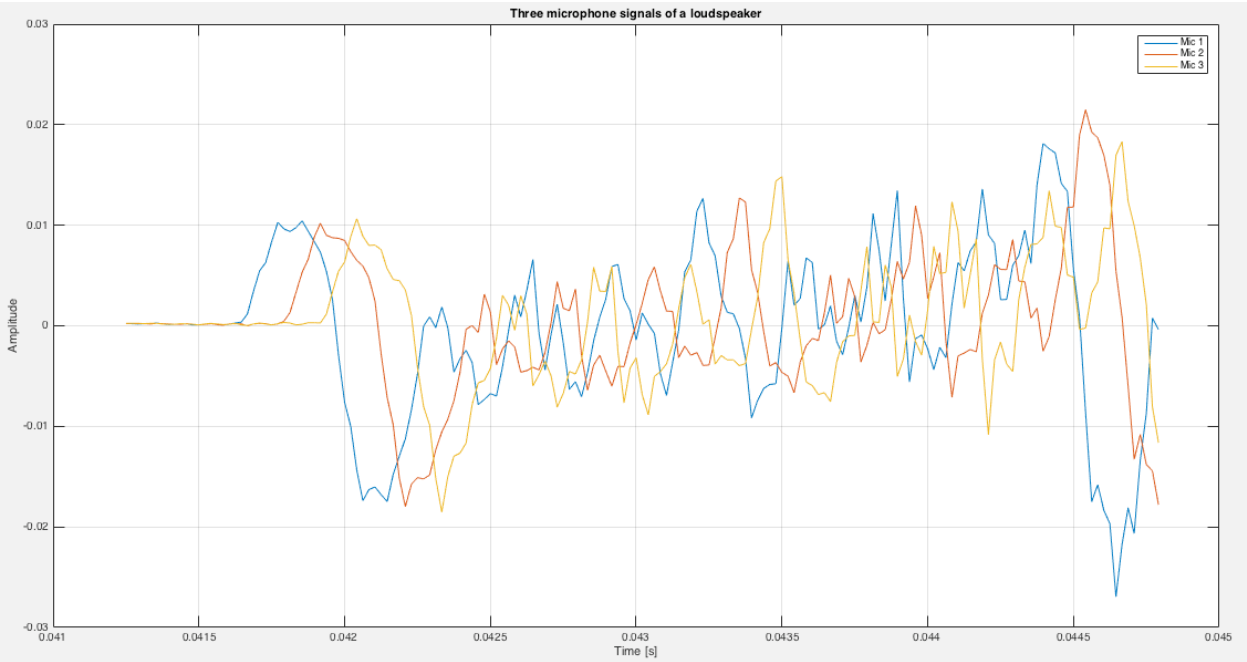


If one of the signals from the microphones is offset in time and aligned to match the MLS excitation, we can see this plot.

From the plot is obvious that the room effect is important (as expected).

The amplitude of the microphone has been amplified to allow better representation.

5 - Three microphones of a loudspeaker



This plot shows the signals from the three microphones of a loudspeaker. They are almost equally spaced on time, since the transmitting loudspeaker is almost parallel to the receiver (transmitting from L and receiving on C).