

Are Acoustic Simulation Softwares Reliable enough for Sound Engineers?

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Abstract

The main aim of the project was to investigate whether or not free acoustic mapping software's were reliable or not. Because these programmes are used so heavily in the Live Sound Industry to assist Engineers with the jobs of pre-production and planning it seemed relevant after using them for a few years to investigate their reliability. Many Professional Loudspeaker Manufacturers such as Meyer Sound and L'Acoustics offer these programmes as a selling point as part of their project ranges and Because these programmes are used so heavily in the Live Sound Industry to assist Engineers with the jobs of pre-production and planning in seemed relevant after using them for a few years to investigate their reliability.

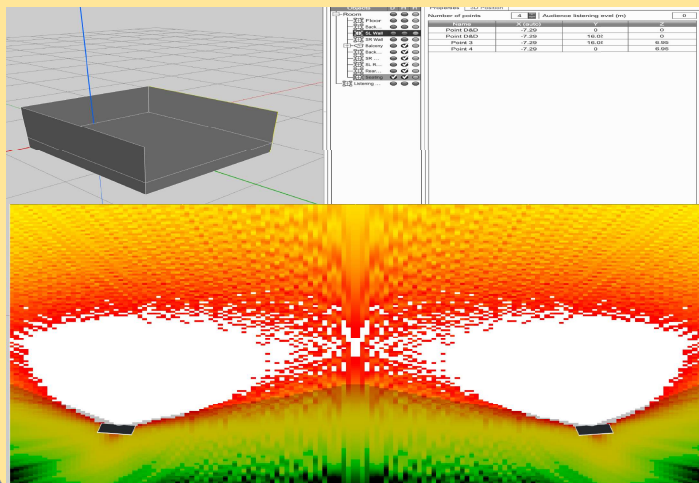
Context:

This project came about after previous working with simulations, specifically using them to assist in pre-production, it does have advantages in this aspect, it saves time on site as the angled no longer need to be worked out, and also assists in the different rigging aspects of designing an audio reproductive system including mechanics and motors.

It was when using the software the idea for this came about. It was being used for a project and being relied on for a project but why? Why put so much trust into something that you don't know the background of or the workings of. This thought in turn resulted in the question that was being set for the project.

Soundvision

Made by L'Acoustics for engineers to get the most out of their products range. According to L'Acoustics (2020) it gives engineers an accurate acoustic and mechanical simulation tool which proves SPL (coverage), SPL Mapping and delay coverage features. Figures 1 and 2 shown two screenshots from Soundvision. Figure 1 is a screenshot from the room build and the Figure 2 is the SPL mapping.



Method

The main phase of the project started by building the room in Soundvision using the dimensions that would be taken on a visit to the space. Once built a suitable system was built into the room. When this had been decided the system was brought into the space for real to compare the coverage and SPL measurements to real life measurements. There were several reasons why the manufacturer L'Acoustics was used for this project. The first was the software, as this provided a familiar environment to work with. The second reasons (split in two) was rental and cost. Around the area of Southampton there are several Audio companies that are part of the L'Acoustics rental network. Using the L'Acoustics rental network a medium sized audio reproductive system in the form of 6 2boxes of L'Acoustics Kara, SB18 Subwoofers and 1 LA12 Rack. This system was chosen after several other systems that were modelled in to the space before the testing period.

The measurements were done using an NTI XL2 and an NTI measurement microphone being placed round the room at different places which were measured and marked with tape prior the test. The measurements from this test are shown in Table 1 at the bottom of the page. There are six columns altogether with three being the predictions from Soundvision and the other three being the data captured in the test.

Results

The results of this project are shown below in Table 1. The results marked overload are down to the measurement exceeding the pre-set measurement range, the overall level of the pink noise was too much for measurement microphone which is because it was only calibrated to 94.6dB. The results however do not give a clear indication of how the sound being produced behaves in the space. It shows the Sound Pressure Level throughout the room which in places has been discovered to not be far the actual measurements, however with no way of adding acoustic materials/treatment into Soundvision, there is no way for the software to work out the RT⁶⁰. This results in a less accurate measurement as the RT⁶⁰ is needed in acoustic simulations for working out reflections.

Distances	2 Min LEQ (dB SPL A) at following distances					
	Predicted	2.02m	Predicted d	4.02m	Predicted	6.02m
0m	98	96.1	95	99.1	95	98.0
3.65m	100	Overload	100	99.9	98	97.3
7.303m	100	94.7	98	97.5	97	96.7
10.953m	100	Overload	100	100.4	98	98.0
14.603m	98	96.4	97	99.5	98	98.9