

The perception and importance of drum tuning in live performance and music production

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Summary

- A research project to discover the values given to and the techniques involved in drum tuning
 - Music producers
 - Professional musicians
 - Tutors
 - Drum technicians
 - Novice musicians
- Developing a quantitative understanding of popular drum tuning
 - Looking at objective methods for documented techniques
 - Tuning to particular musical frequencies
 - Opportunities for benchmarking and repeatability

Drum tuning in music production

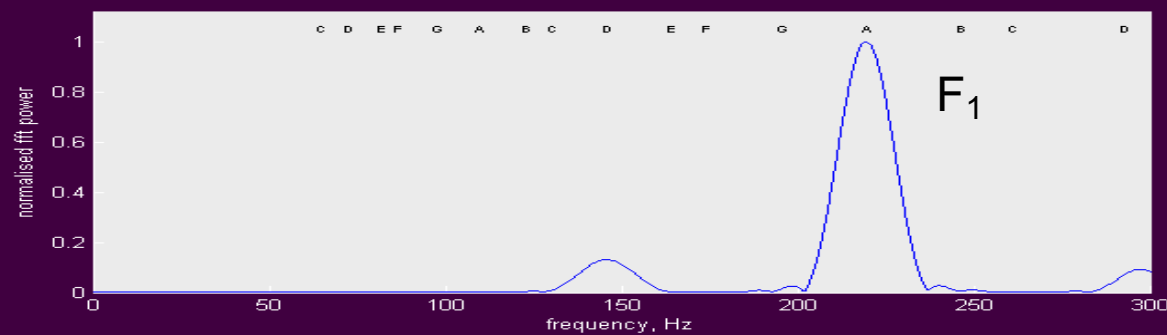
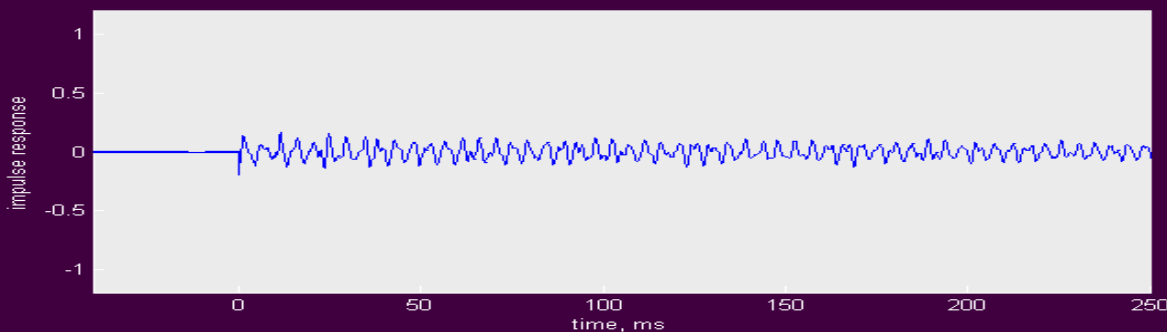
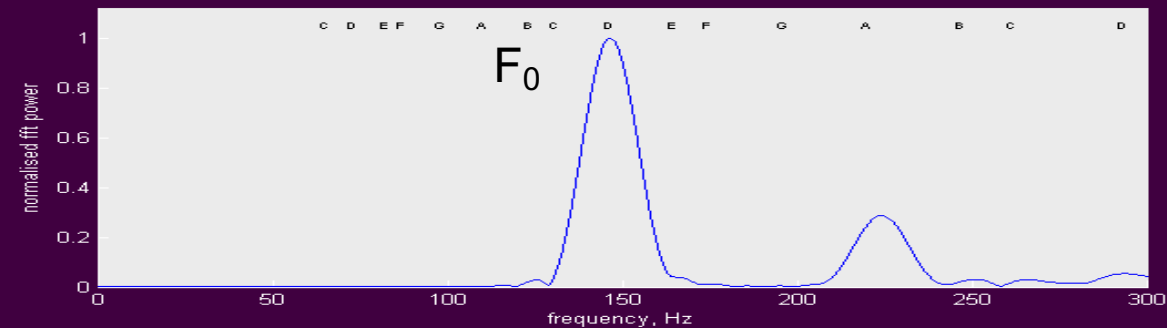
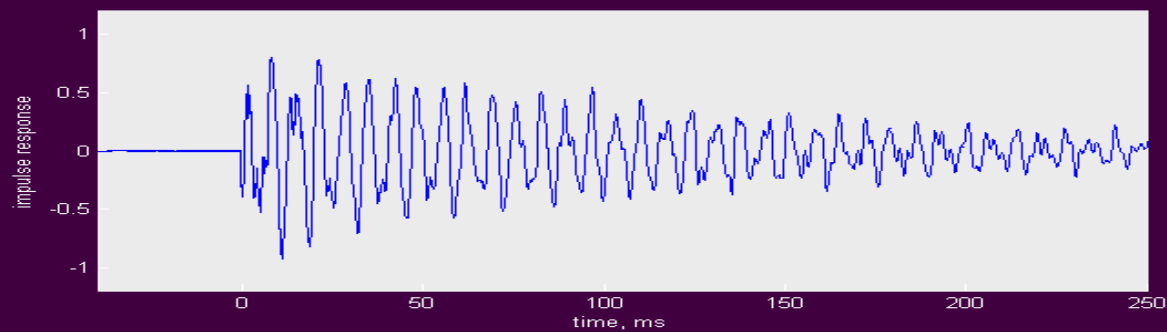
- The importance of a drum sound for the specific music genre
- Drum setup can take 15-25% of the session?
- 'Right first time' recording
- Revisiting/replicating drum sounds
- Personal benchmarks
- An indication that studio engineers and producers would embrace technical assistance in drum tuning

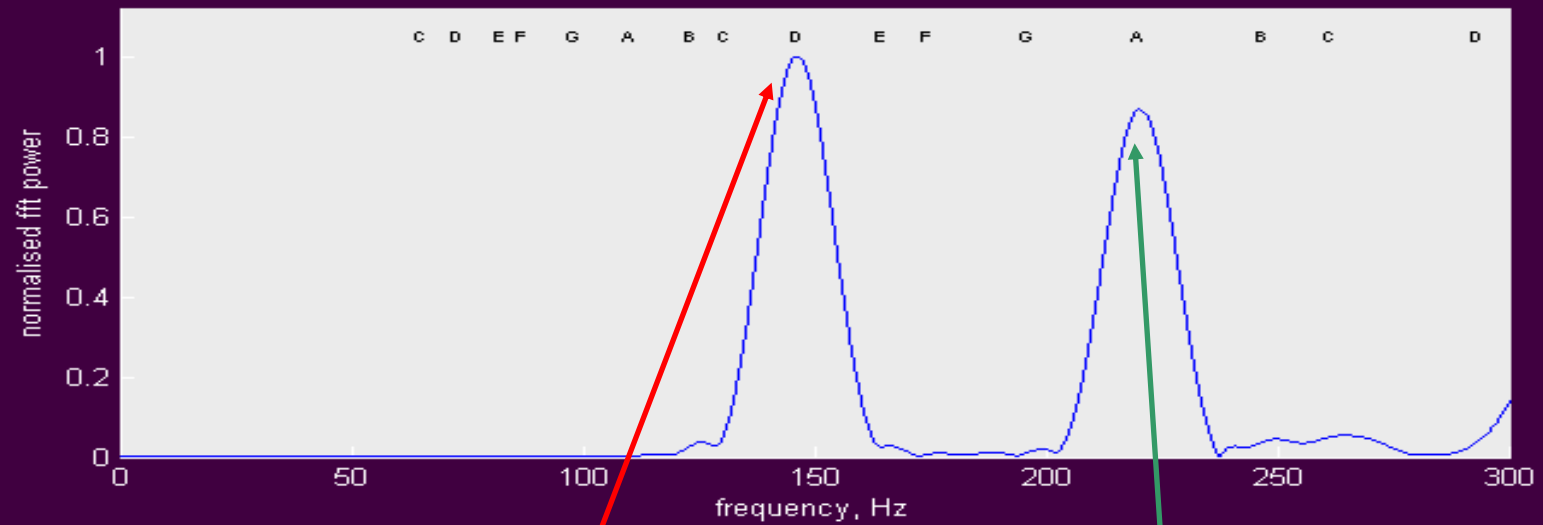
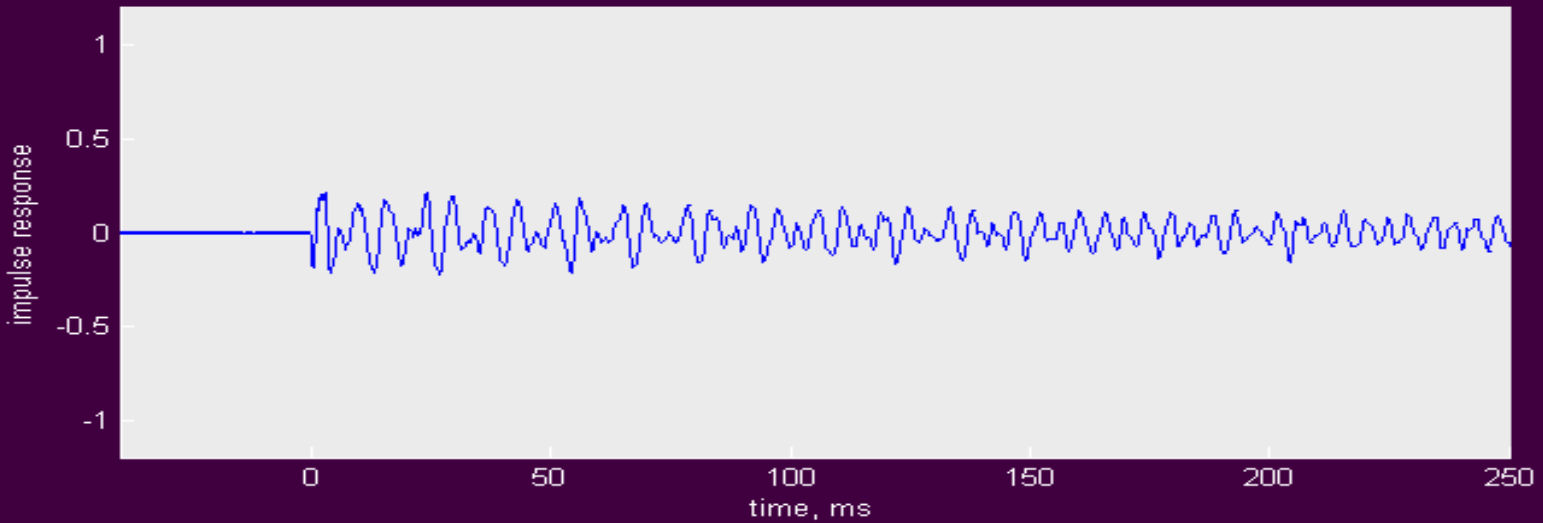
The performer's perspective

- Professional musicians
 - Have the ability to tune by ear to a desired sound
 - No guarantee of ability to perform exact repetition
 - Some desire to tune to specific musical frequencies
 - Sometimes disagree with the producer on drum setups
- Novice musicians
 - Drum tuning is a considerable challenge
 - No quantified education methods
 - Would embrace the ability to tune their kit to a particular genre or to replicate the sound of a favourite musician
 - Often uncomfortable with advanced technology and engineering terminology

Quantitative analysis of drum tuning methods

- Understanding the acoustics of a drum response
- Achieving a uniform pitch across the drumhead
- Tuning the pitch of the drums in a drum set
- Attack and decay profiles



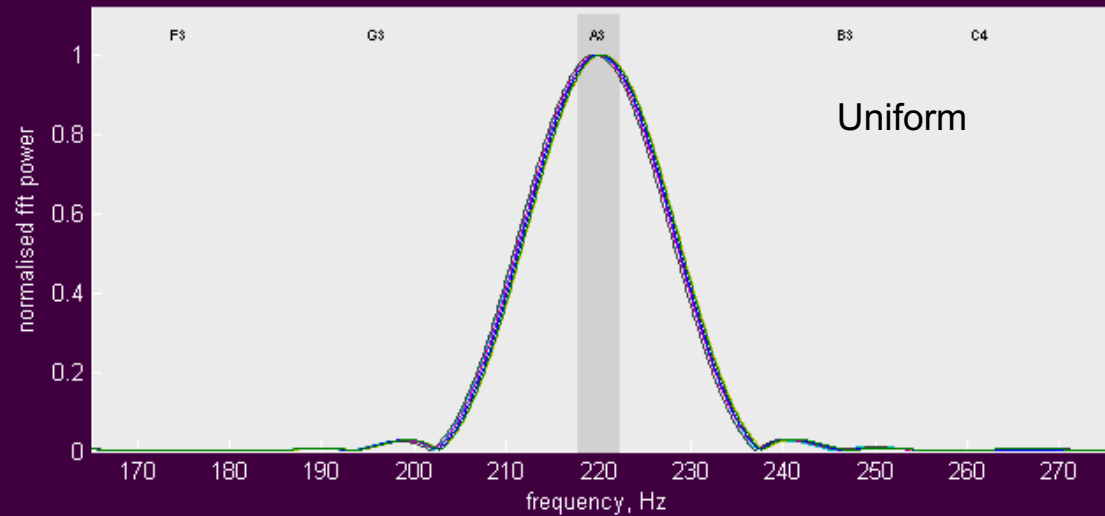


$F_0 = D_3 = 146.8$ Hz

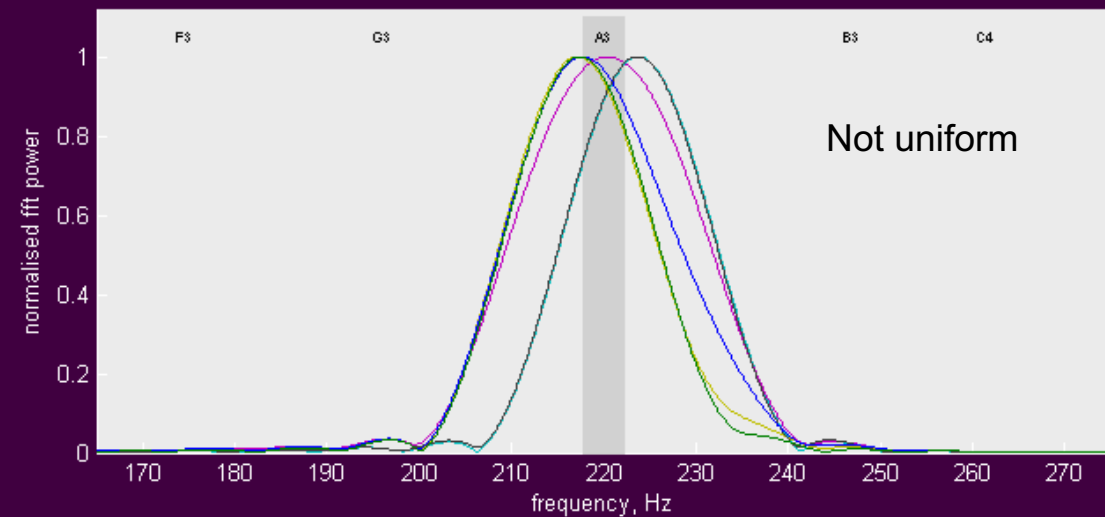
$F_1 = A_3 = 220$ Hz

Achieving a uniform pitch across the drumhead

		F_1 (Hz)	dF_1 (Hz)
◀	Lug 1	219.6	-0.4
◀	Lug 2	219.9	-0.1
◀	Lug 3	220.4	+0.4
◀	Lug 4	219.6	-0.4
◀	Lug 5	220.1	+0.1
◀	Lug 6	220.3	+0.3

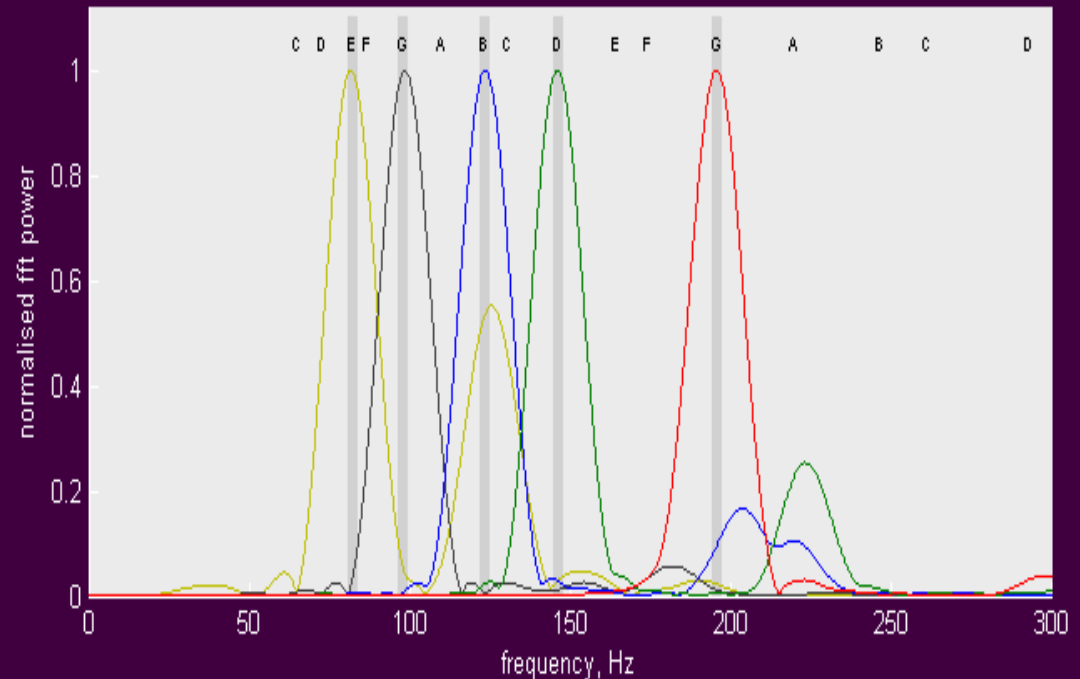


		F_1 (Hz)	dF_1 (Hz)
V	Lug 1	223.7	+3.7
◀	Lug 2	220.5	+0.5
^	Lug 3	217.2	-2.8
V	Lug 4	223.7	+3.7
◀	Lug 5	217.8	-2.2
^	Lug 6	217.4	-2.6



Tuning the pitch of the drums in a drum set

	Target (Hz)	F_0 (Hz)	dF_0 (Hz)
20" Kick Drum	82.4	81.8	-0.6
16" Floor Tom	98	98.7	+0.7
13" Rack Tom	123.5	123.6	+0.1
12" Rack Tom	146.8	146.1	-0.7
14" Snare	196	195.8	-0.2



snare → 12" tom → 13" tom → 16" floor tom → 20" kick drum
=
G3 → D3 → B2 → G2 → E2

Analysing the decay profile of a drum setup

Attack time, T_a

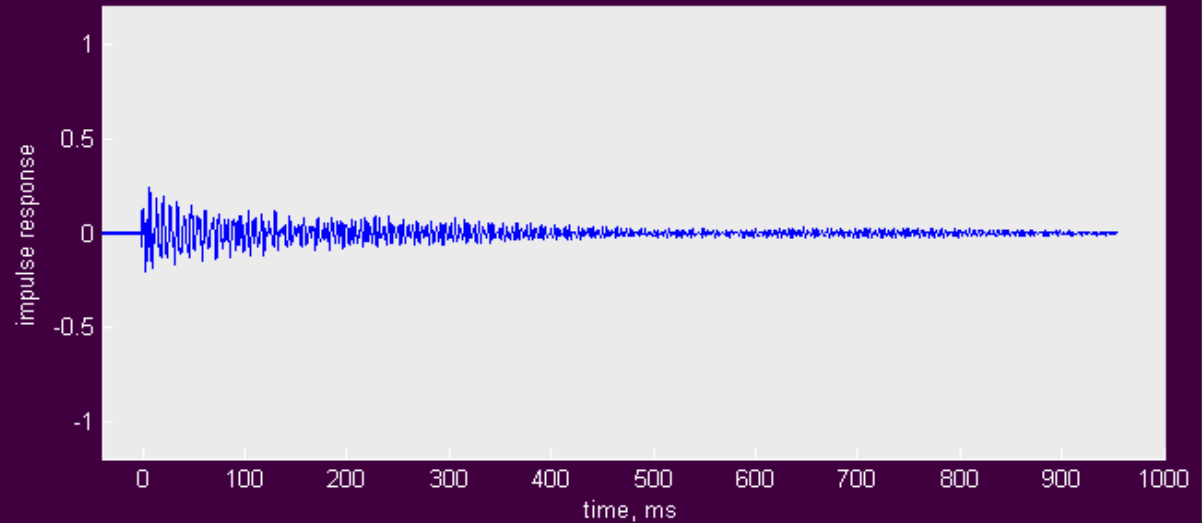
8.7

ms

Decay time, T_d

752

ms



Attack time, T_a

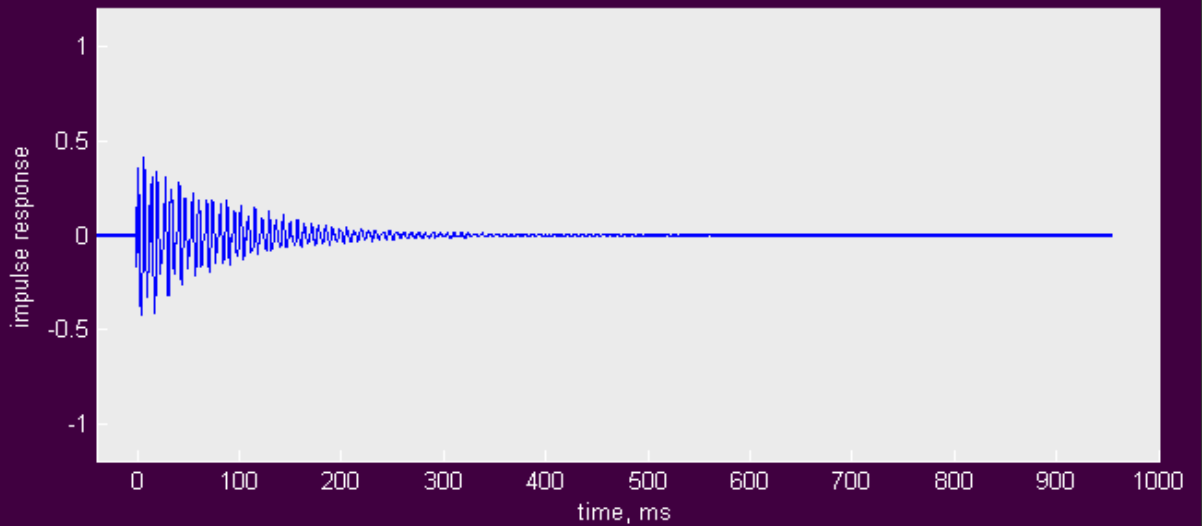
5.5

ms

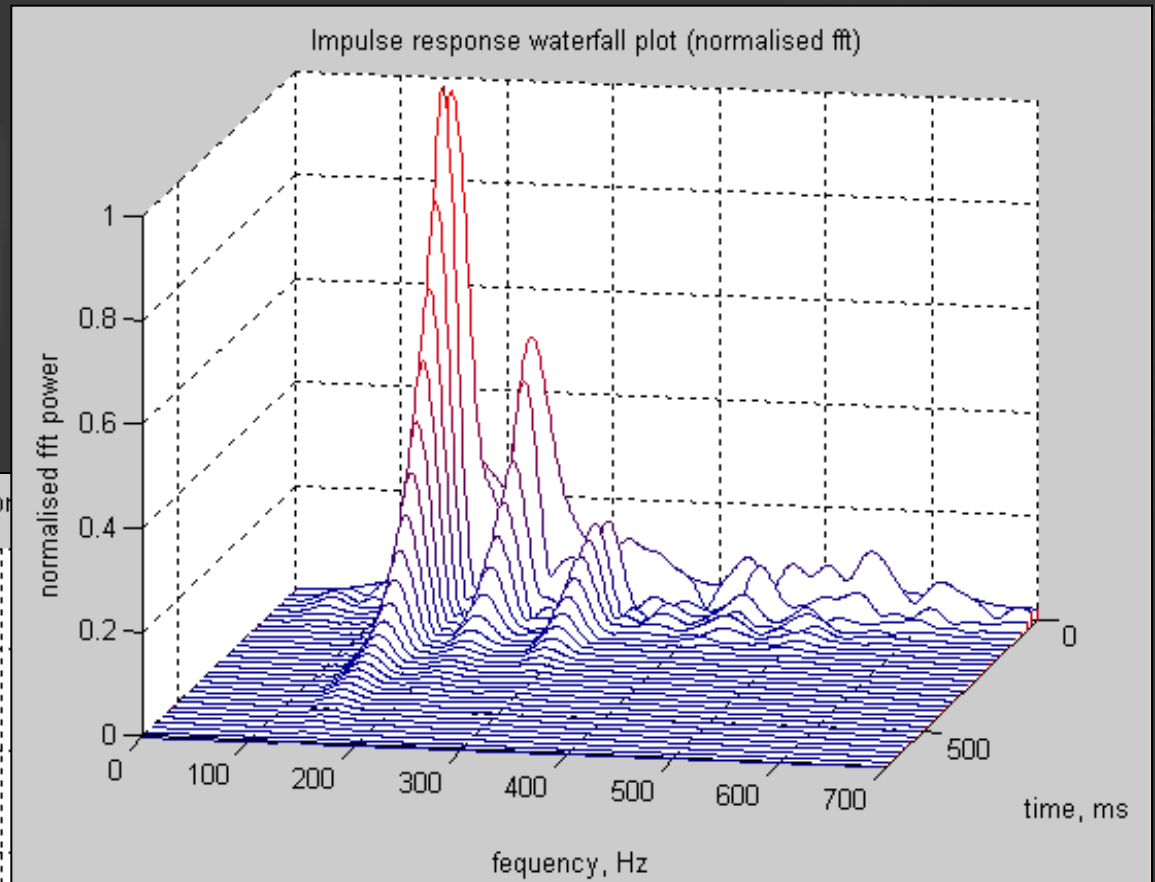
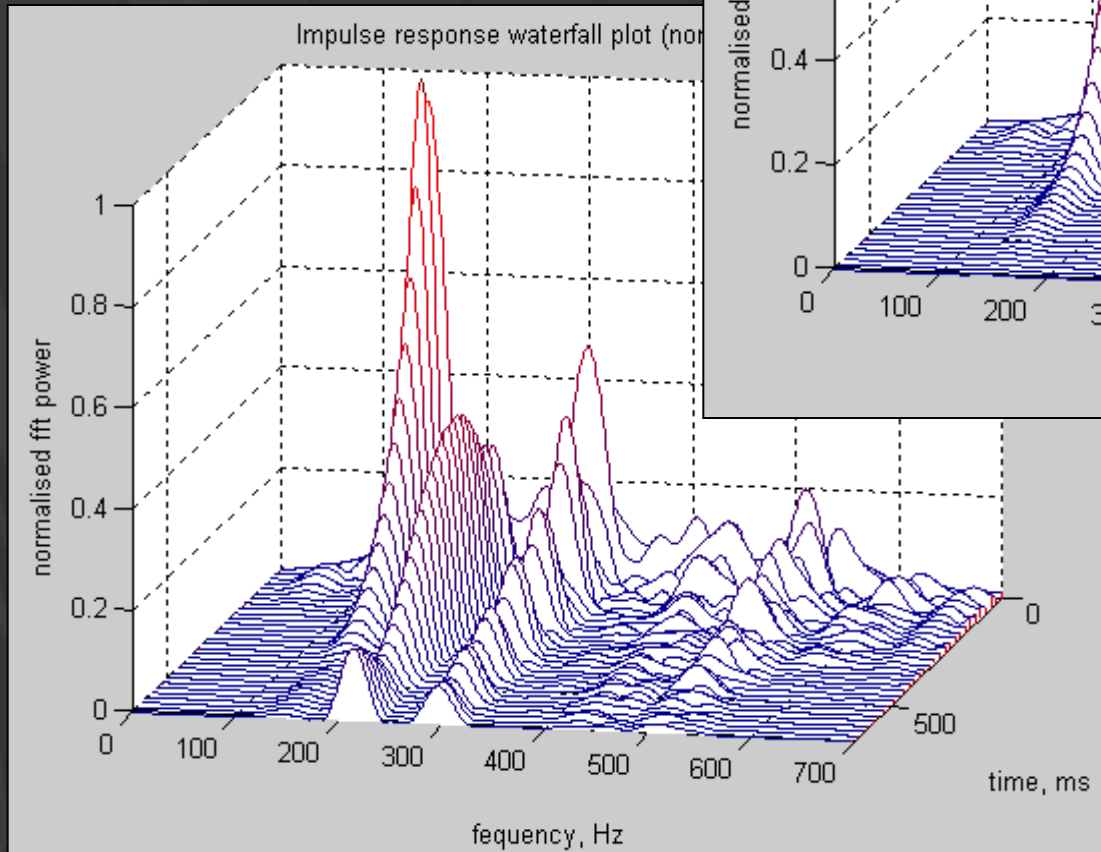
Decay time, T_d

199

ms



Analysing the decay profile of a drum setup



Conclusions

- Drum tuning is a valuable, personal and regularly practiced process
- This is often a critical process in studio production
- No quantified method has previously been documented, so drum tuning has become a 'black-art' process
- Quantitative analysis has been described, which could assist with:
 - increased musical precision
 - benchmarking for music genres
 - repeatability of setups
 - drum tuning education

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Acknowledgements

A number of musicians, producers and engineers have contributed to this research by interview, participation at focus group meetings, assisting with system testing and through discussions at recording sessions and live performance events. Most notably, the authors would like to thank the following for their contributions:

Ian Croft and Alex Reeves from Drummer Magazine; Drummers/Tutors Nick France and Steve McLachlan; Pete Whittard and students at The Institute of Contemporary Music Performance, London; Drum Technicians Jay Morris and Oli Perry; Producers/Studio Owners Mick Venning (Orchard Cottage Studios) and Neil Rogers (Half-ton Studios).

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The background of the slide is a dark grey color. On the right side, there are faint, light grey silhouettes of two people walking towards the right. The person in front is wearing a hat and carrying a bag. The person behind is taller and appears to be walking in step with the first person. The overall aesthetic is minimalist and professional.