# Acoustic Analysis and Dataset of Transitions Between Coupled Rooms

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INTRODUCTION

- Room acoustics is crucial for virtual reality, physical modelling and dereverberation
- Single room acoustics has been researched but the transition between coupled rooms remains little explored
- A dataset of spatial room impulse responses can be of use in research communities
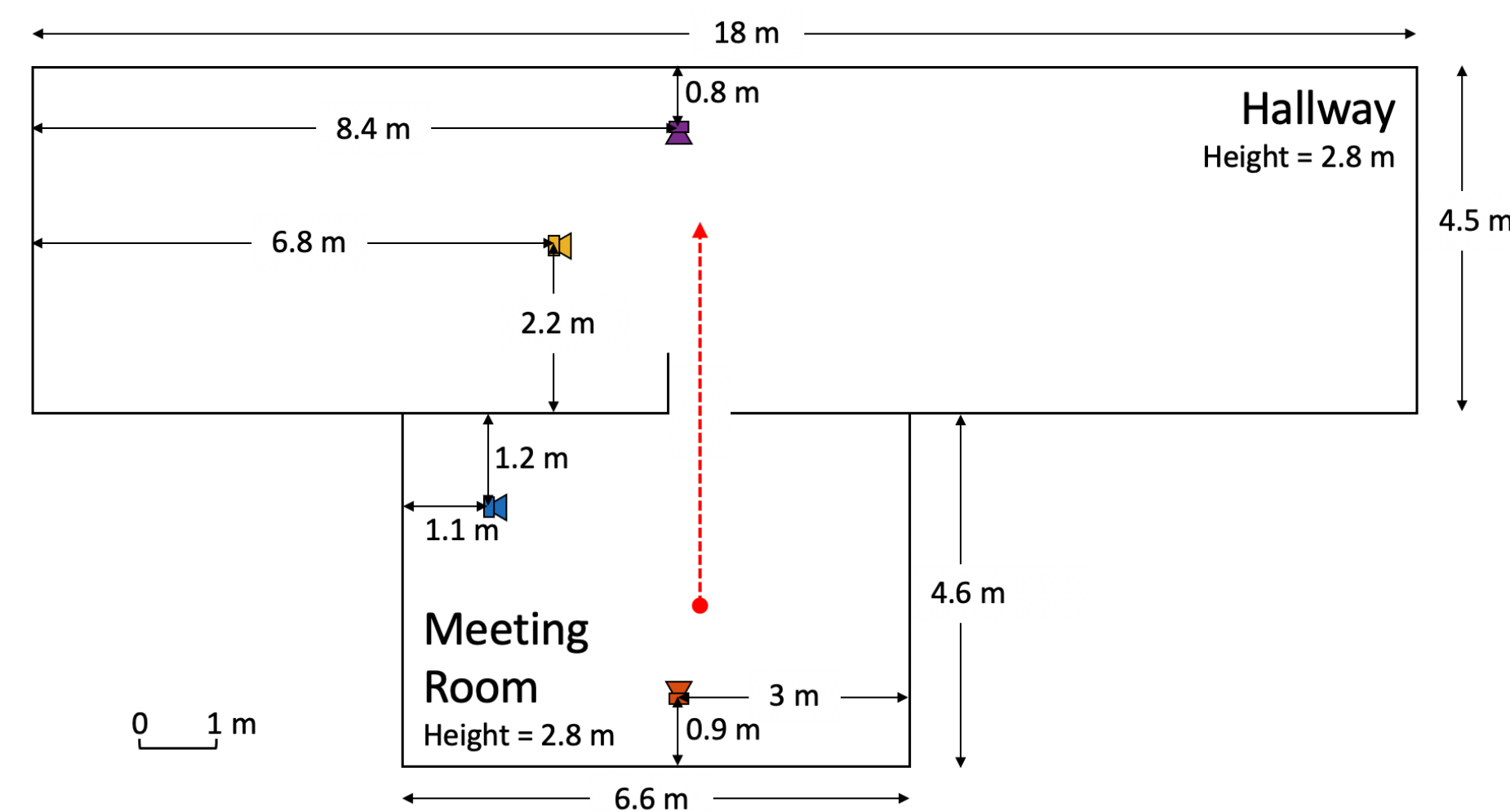

Room geometries and source positions
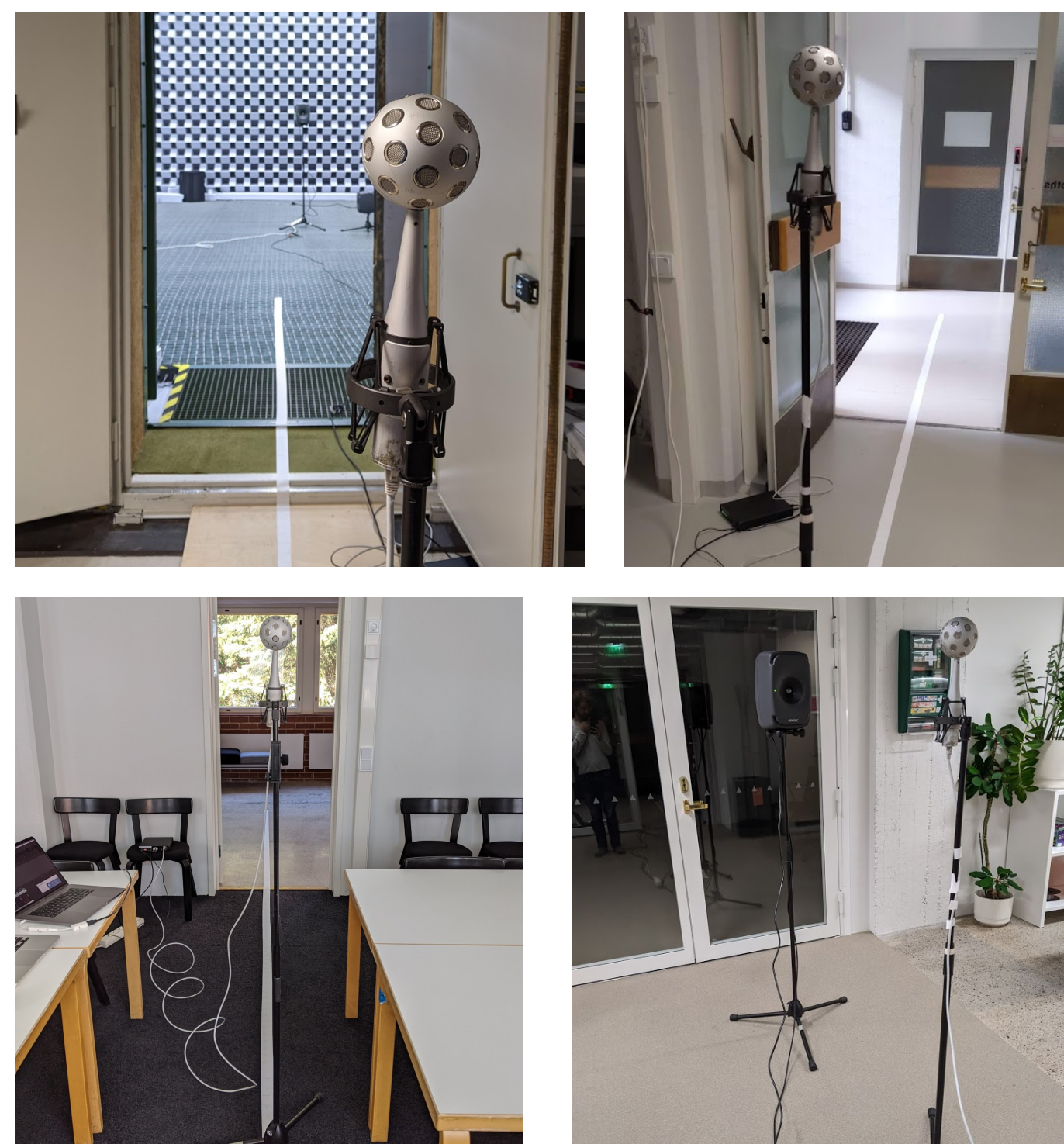
Impulse response measurement setup

DATASET ACQUISITION

- Four coupled room pairs
- Four source locations for each
- 101 measurements across 5m
- 4th order spatial room impulse responses

| Room 1	Volume (m^3)	RT_{60} (s)	Room 2	Volume (m^3)	RT_{60} (s)
Office	63.8	0.22	Anechoic Chamber	484	0.18
Office	202	0.32	Stairwell	299	0.92
Meeting Room	86.5	0.55	Hallway	227	1.53
Office	92.4	0.38	Kitchen	175	0.41

Volume and reverberation time of the four measured coupled room pairs
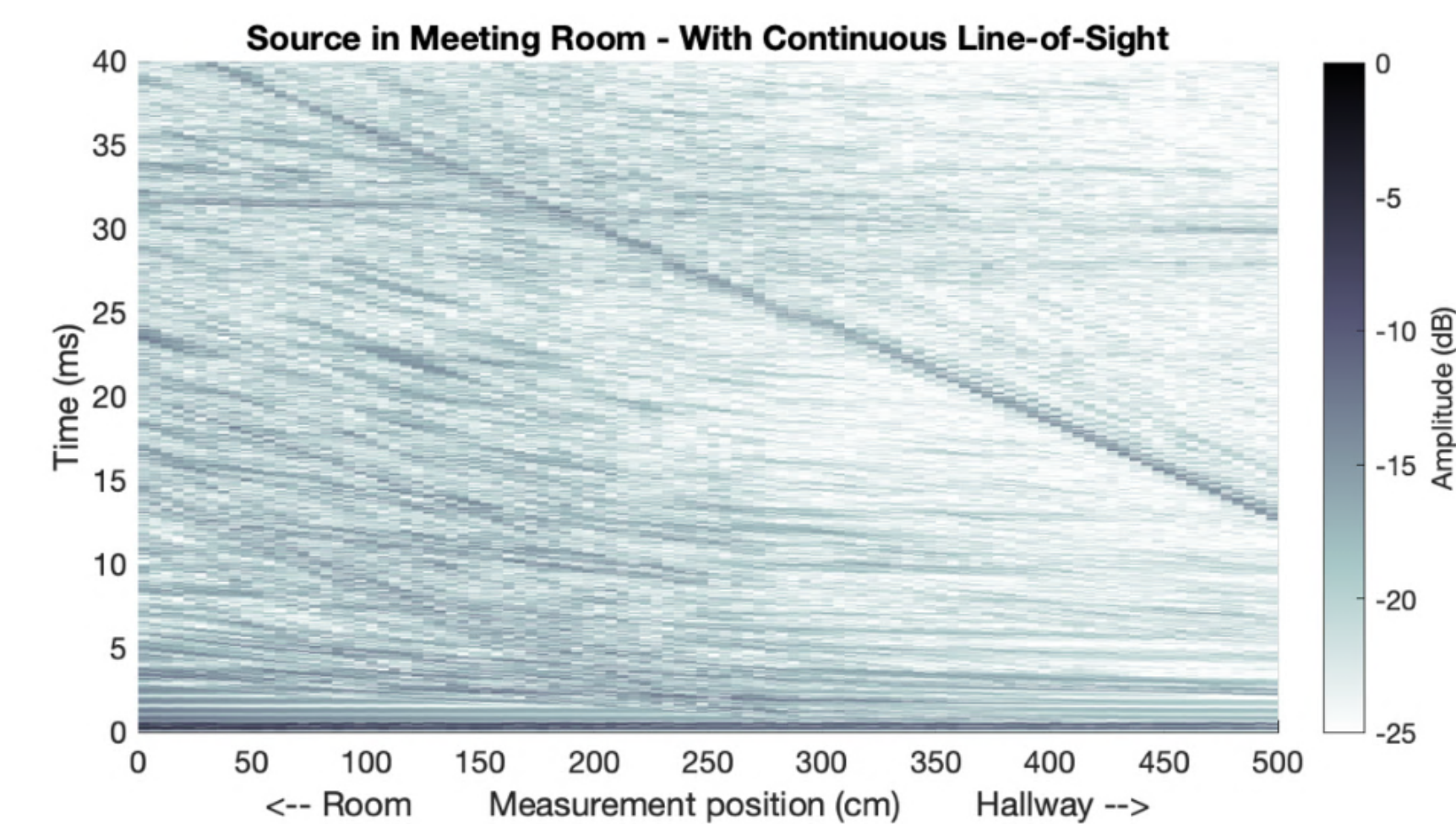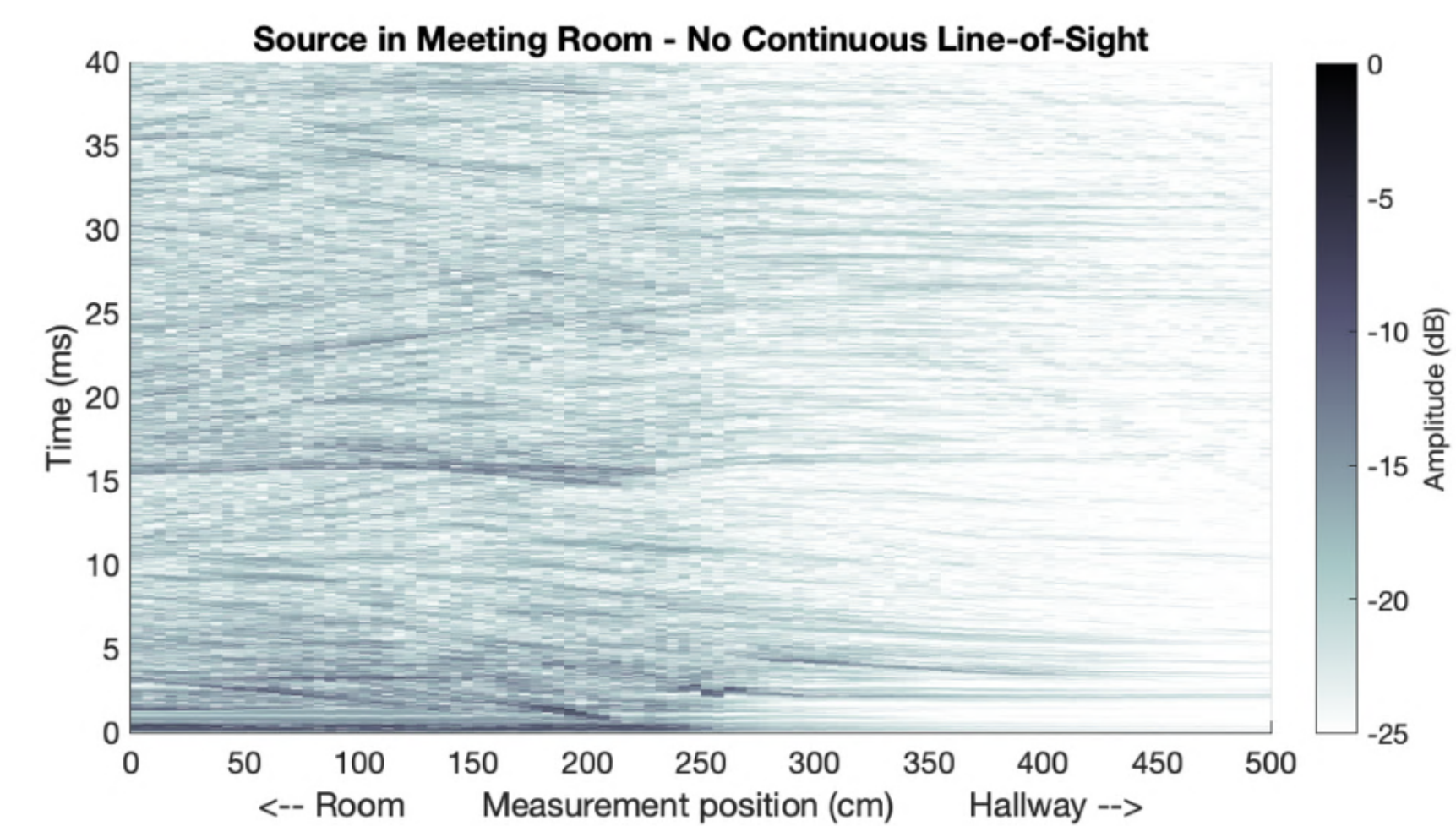
Time domain analysis of the impulse responses

DATASET ANALYSIS

- Room transitions are complex, especially around coupling aperture
- Source position influences acoustic response
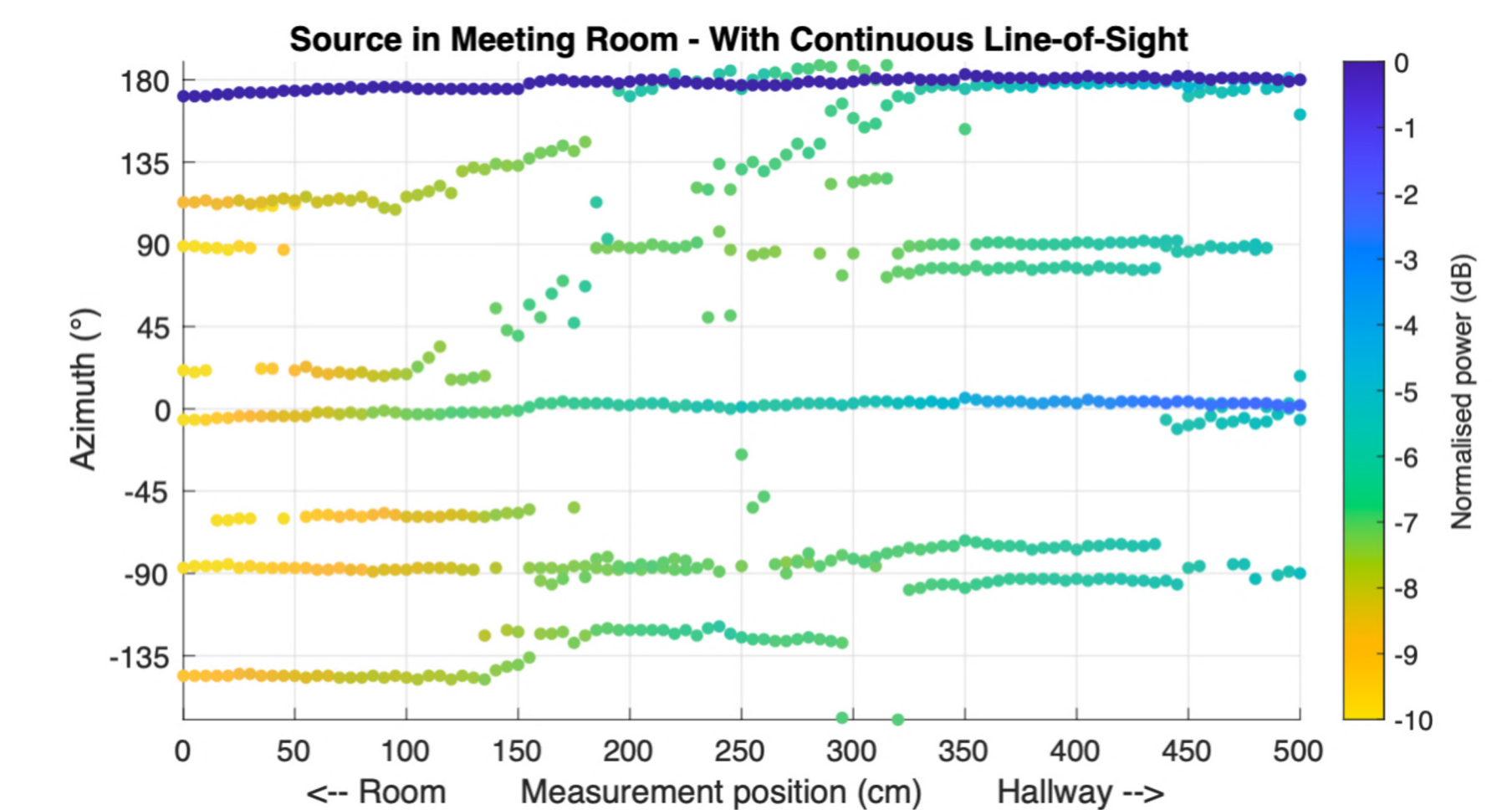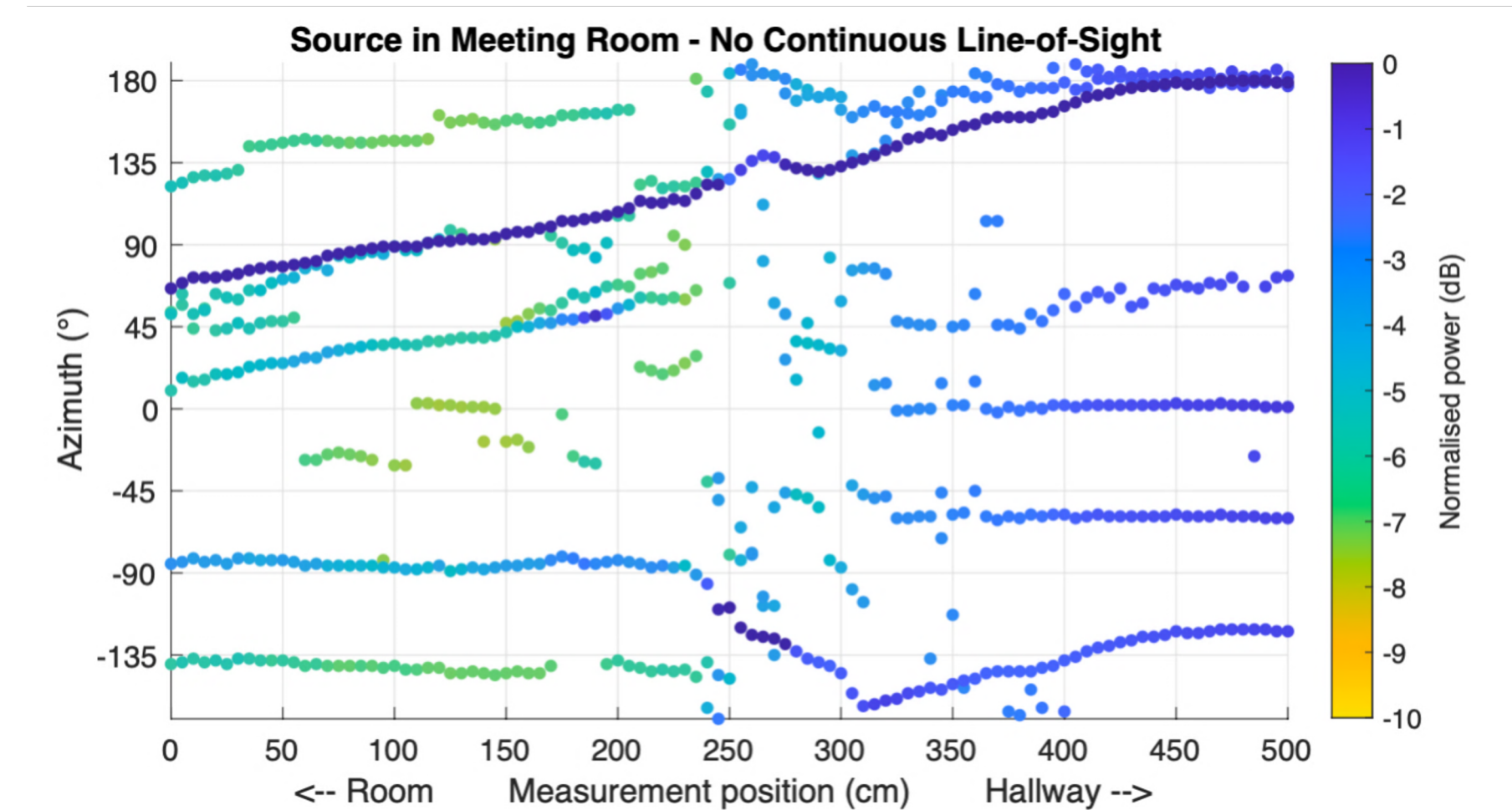
Directional analysis of 4th order impulse responses

DATASET USES

- Parametric room acoustics modelling
- Dereverberation algorithms
- Virtual reality
- Machine learning
- Room impulse response interpolation
- Download the dataset now:
  https://doi.org/10.5281/zenodo.4095493