

Hybrid Higher-order Ambisonic Recording

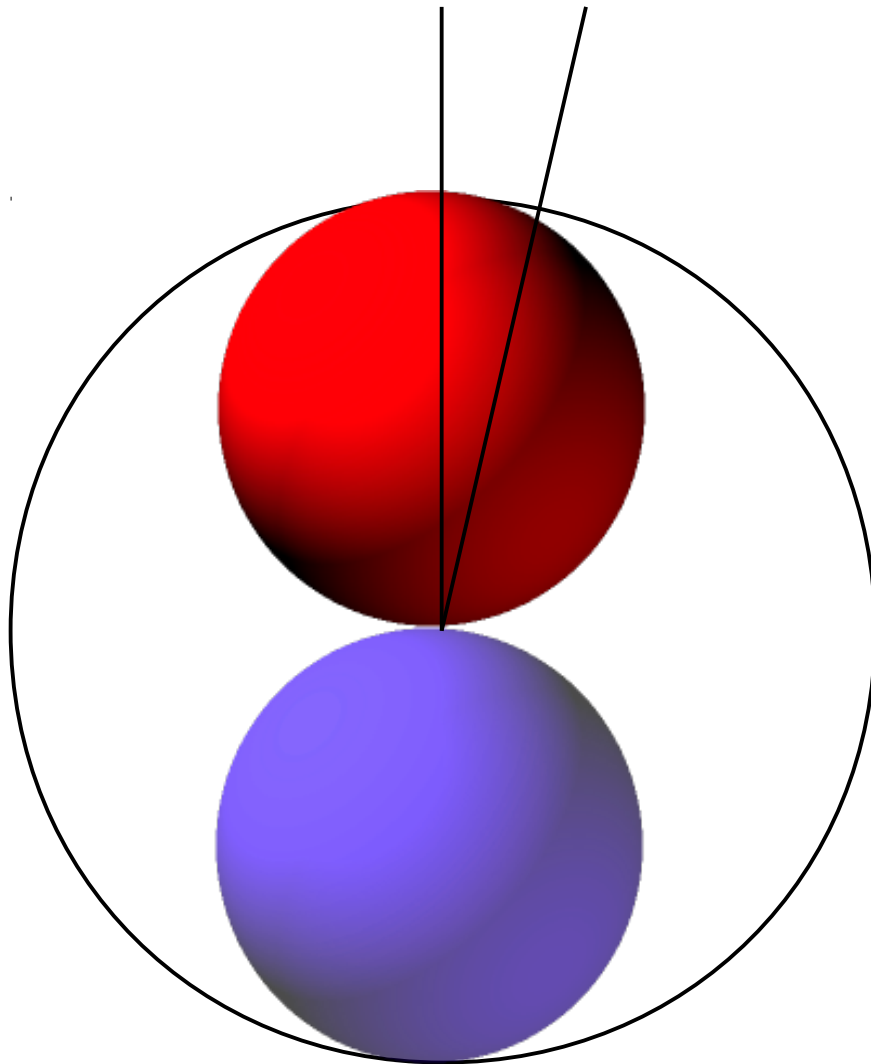
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Overview

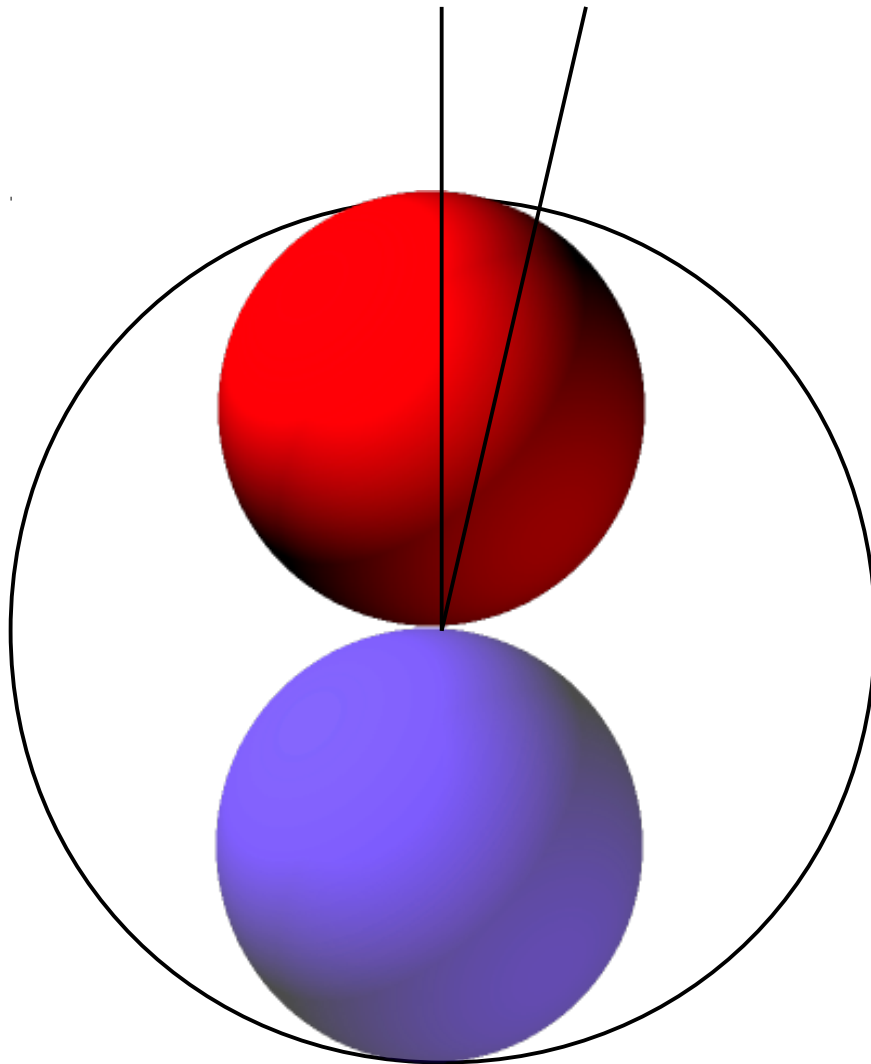
- Quick introduction to Higher-order Ambisonics
- The problem with native HOA microphones
- Hybrid (mixed-order) recording approach

What's wrong with first-order Ambisonics?



Low angular resolution:
slow off-axis roll-off.

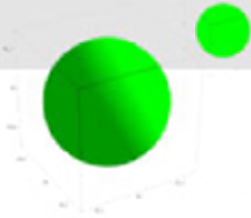
What's wrong with first-order Ambisonics?



In practice, this means
instability
and a small
sweet spot
(= listening area)

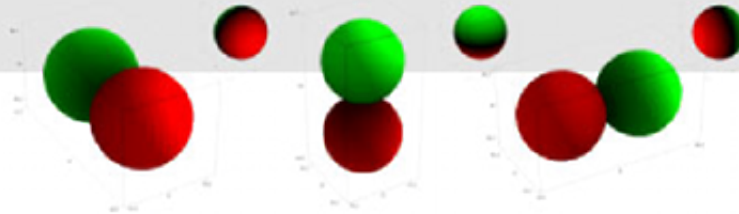
Higher-order Ambisonics

0th order



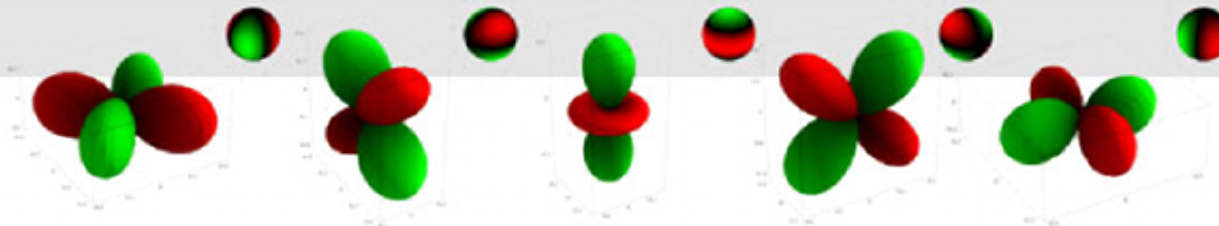
channels: 1

1st



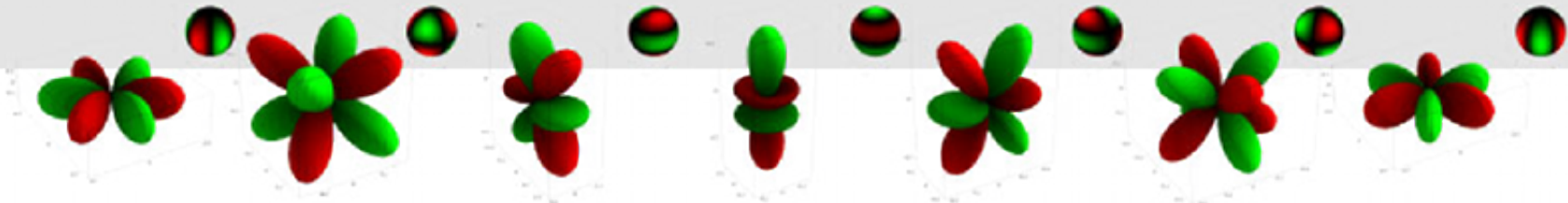
4

2nd



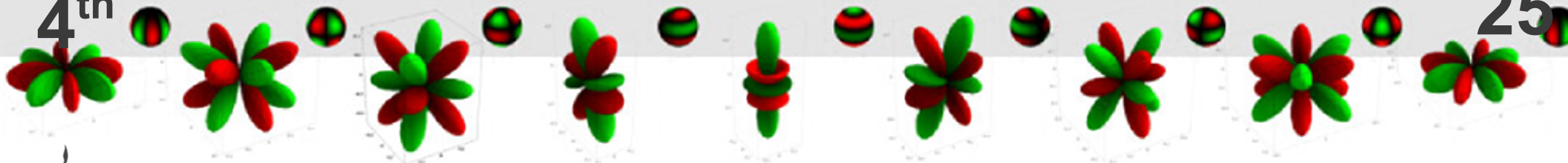
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3rd



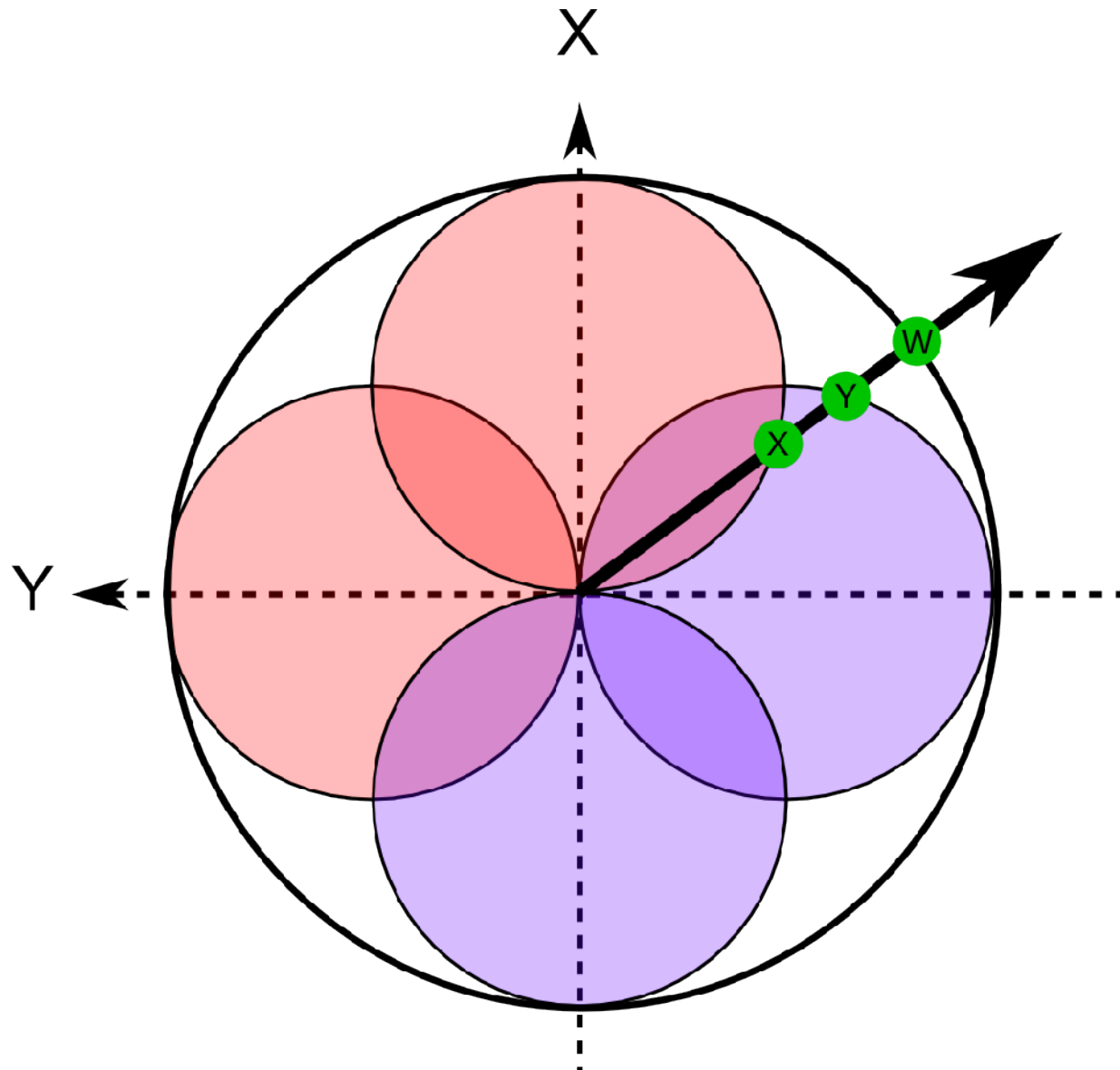
16

4th



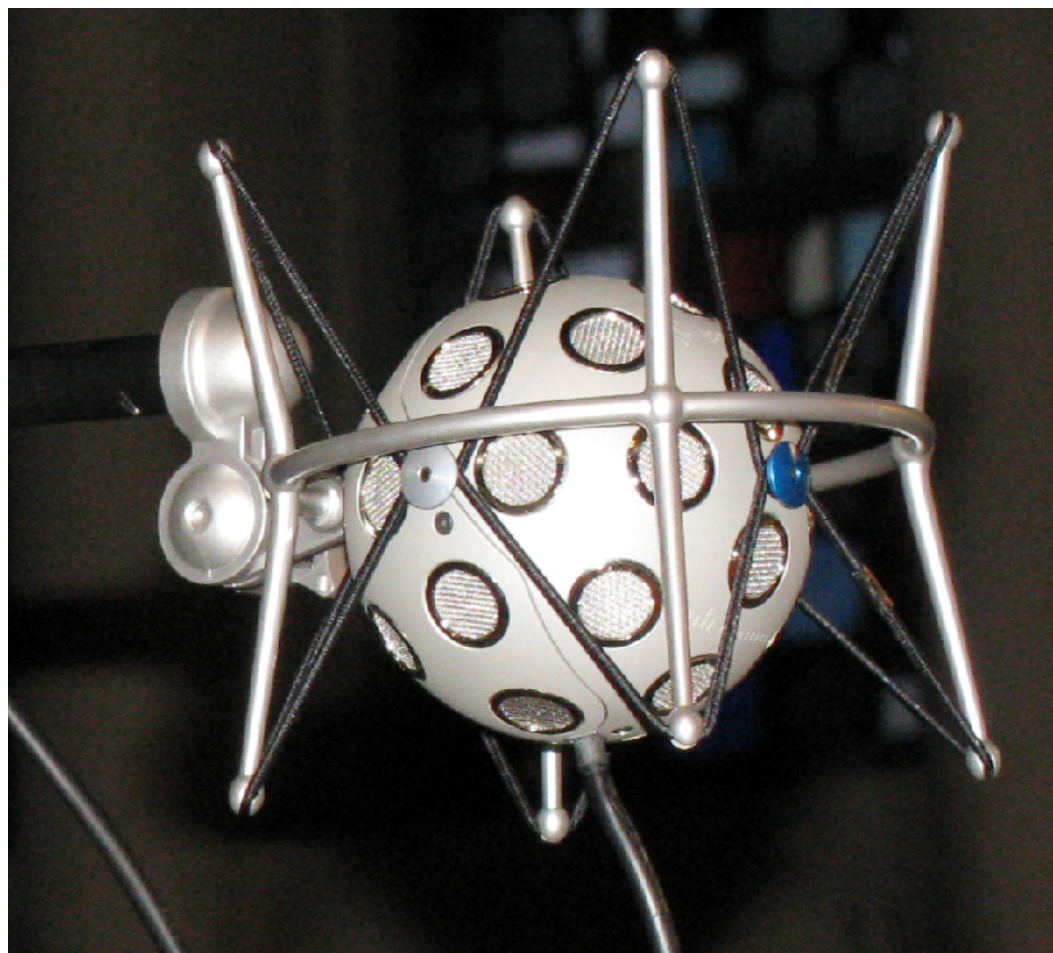
25

Ambisonic panning



Native HOA Microphones

- They exist.
- They work. Kind of.
- They need lots of very messy signal processing.
- They have noise and timbral issues.



Bottomline:

Ok as a shotgun replacement for dialog or maybe atmo recording, not too good as a classical main microphone.

What to do while we wait for the perfect HOA microphone?

Let's combine a first-order main microphone with spot mics panned in higher order.

Main mic provides nice, coherent ambience (placed at the “best seat in the auditorium”).

Spots provide HOA sharpness, stability of localisation, and enlarged listening area.

Hybrid HOA miking

- Differs from stereo spot-miking: each instrument or “localisable unit” gets their own spot, regardless of loudness balance.
- Spots must be carefully time-aligned to the main mic.
- Spots should be highly directional, to avoid echo problems. Patterns chosen to suppress other instruments as best as possible.
- Mixing automation must be used to turn down spots selectively at dangerous moments.

Hybrid HOA miking

- Worst-case situation: everyone is playing some subtle pp stuff, and a single trumpet has a sfffz.
 - Trumpet echoes all over the place, in every single spot mic. Worse the larger the area is.
 - Trumpet excites the room, each spot mike picks up reflections, which ruin the ambience image.
- Dipping the spots with automation can help. But hey, it's real life: you can't always win. Sometimes, the artifacts sound really cool. Sometimes, they don't.

HOA Pop/Jazz Production









<Ardour HOA Demo>