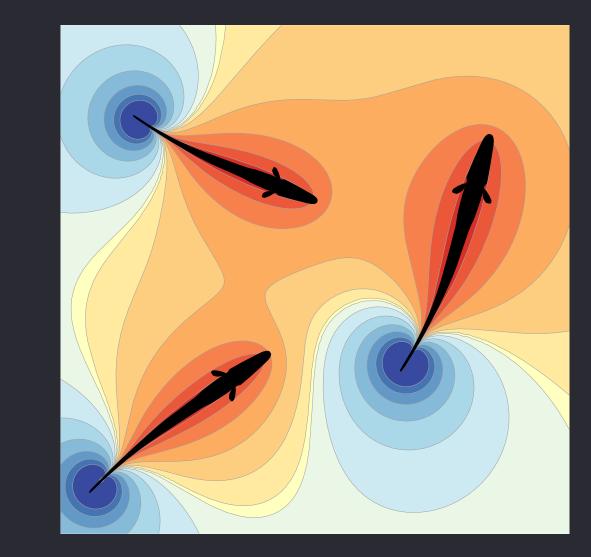
Bypassing time-frequency uncertainty in the detection of transient communication signals in weakly electric fish

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Introduction

The time-frequency tradeoff makes reliable signal detection and simultaneous sender identification by simple Fourier decomposition in freely interacting weakly electric fish impossible. This profoundly limits our current understanding of chirps to experi-

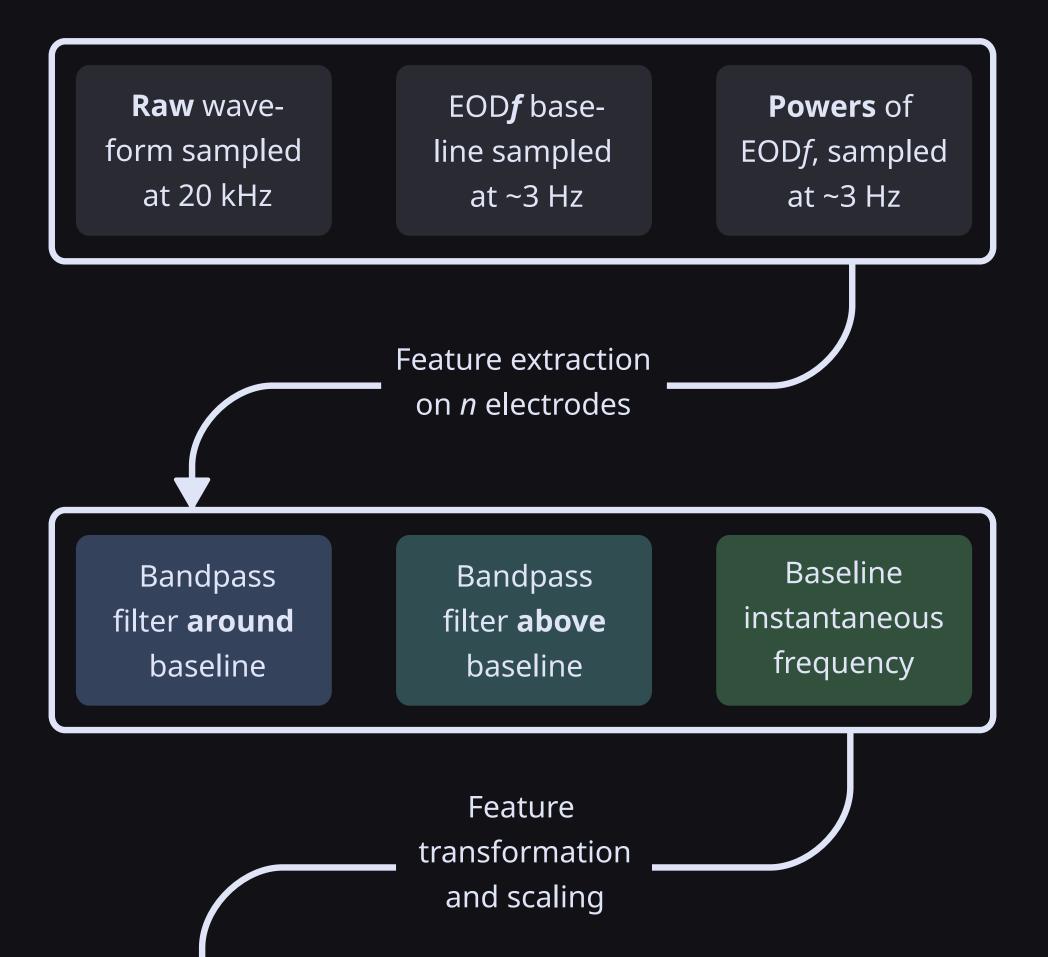
Chirps during competition

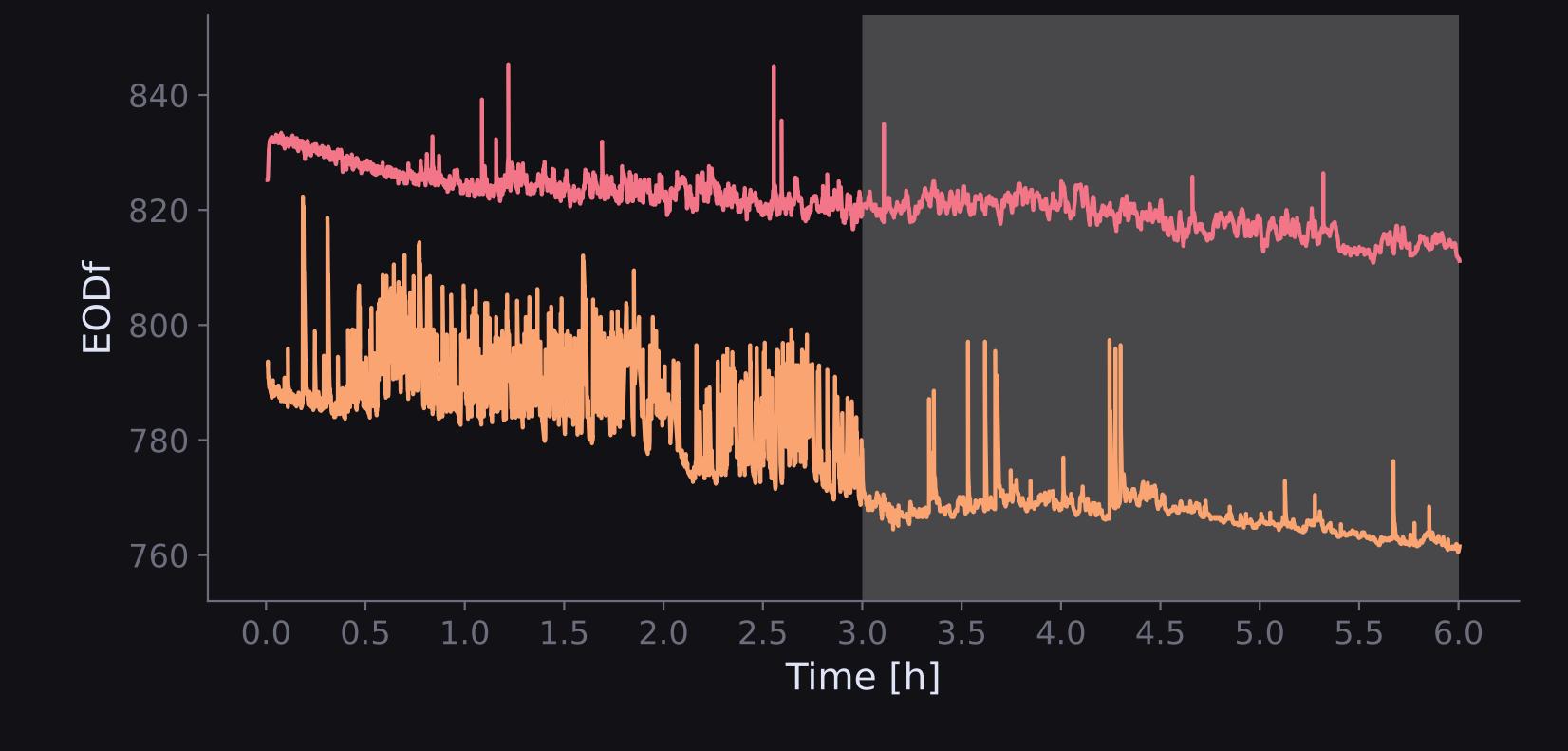




ments with single - or physically separated - individuals.

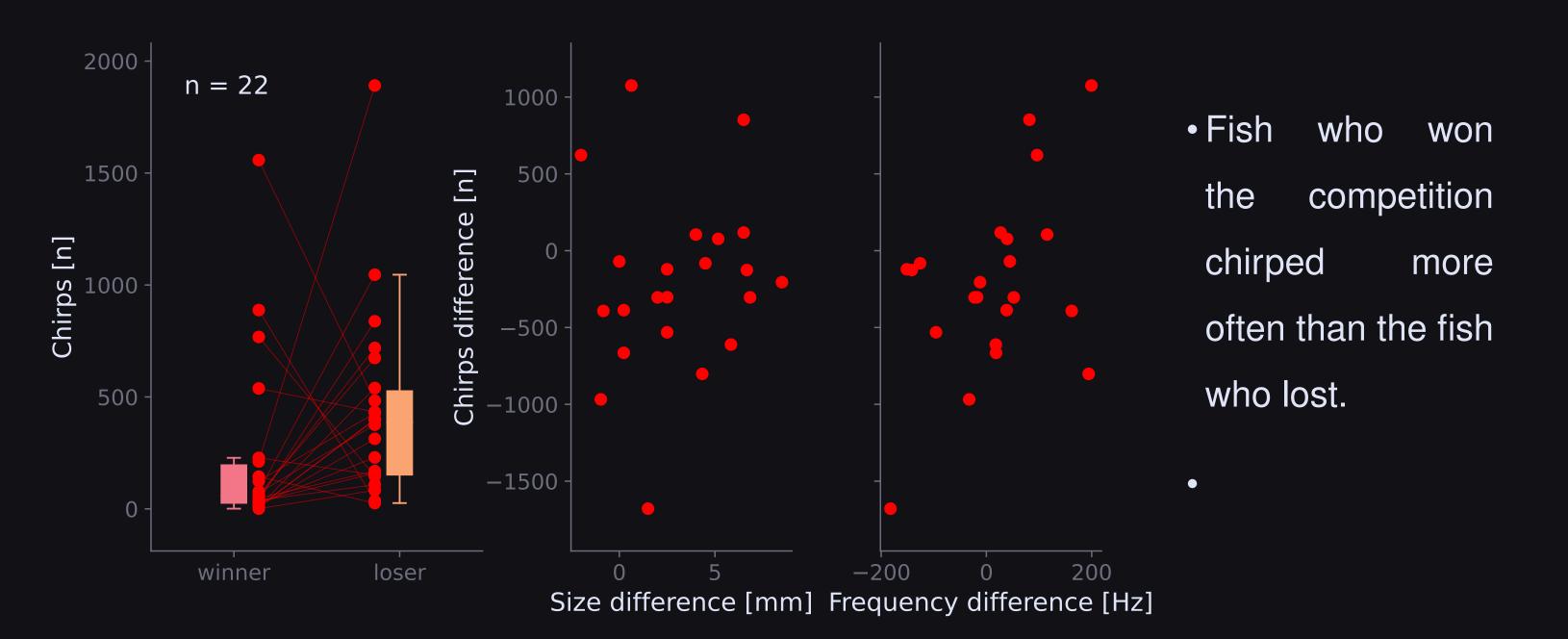
Chirp detection

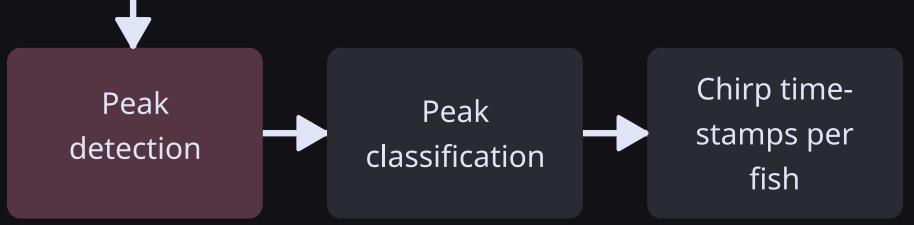


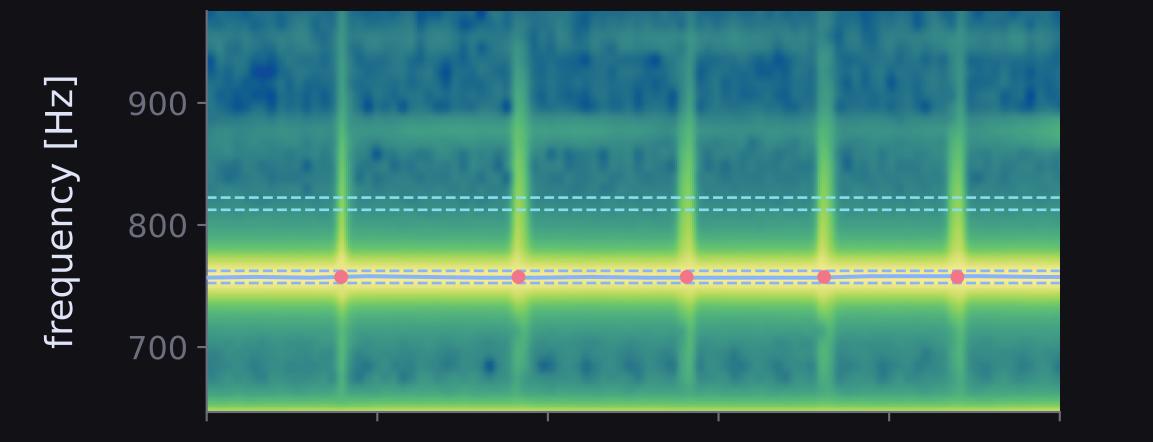


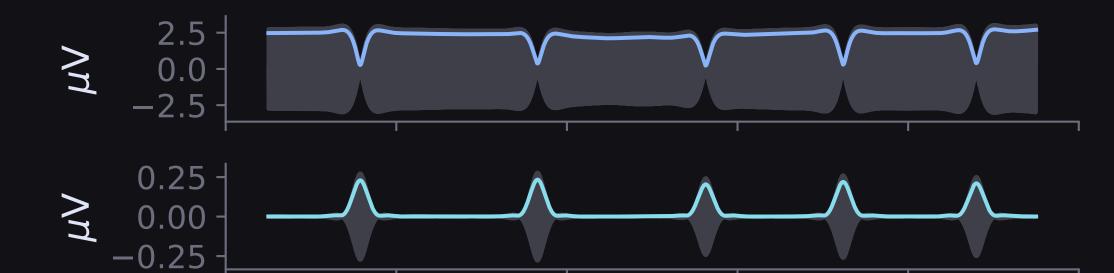
• Two fish compete for one hidding place in one tank,

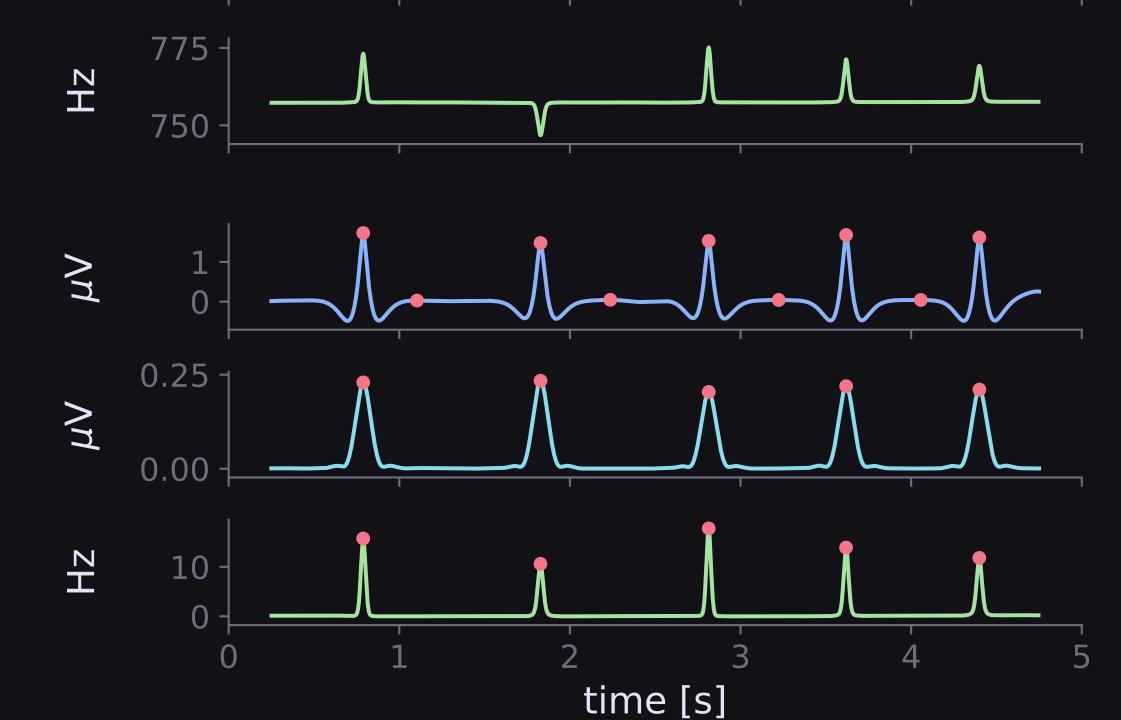
• Experiment had a 3 hour long darkphase and a 3 hour long light phase.



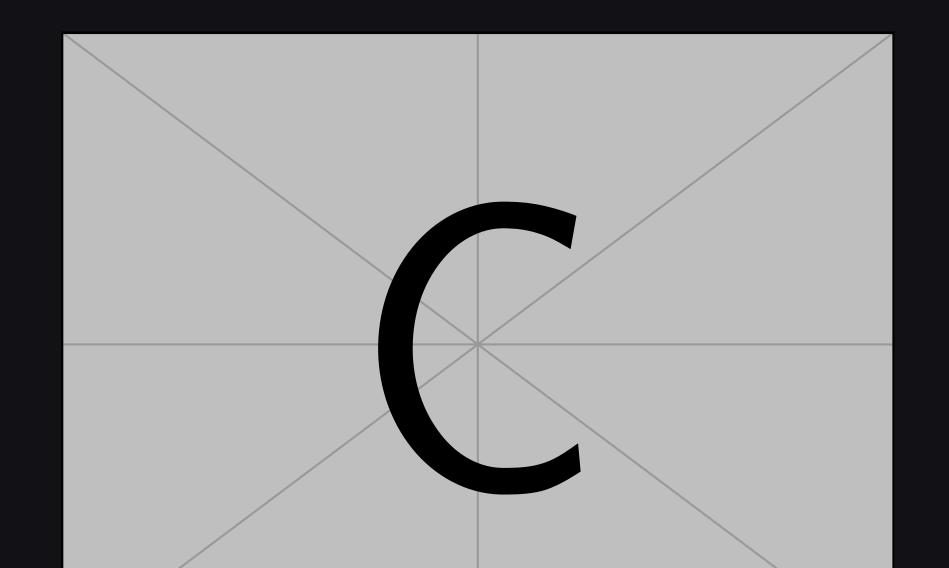








Interactions at modulations



Conclusion

• Our analysis is the first to indicate that A. leptorhynchus uses long, diffuse and synchronized EOD f signals to communicate in addition to chirps and rises.

• The recorded fish do not exhibit jamming avoidance behavior while close during synchronous modulations.

• Synchronous signals **initiate** spatio-temporal interactions.

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