# Detection of transient communication signals in weakly electric fish

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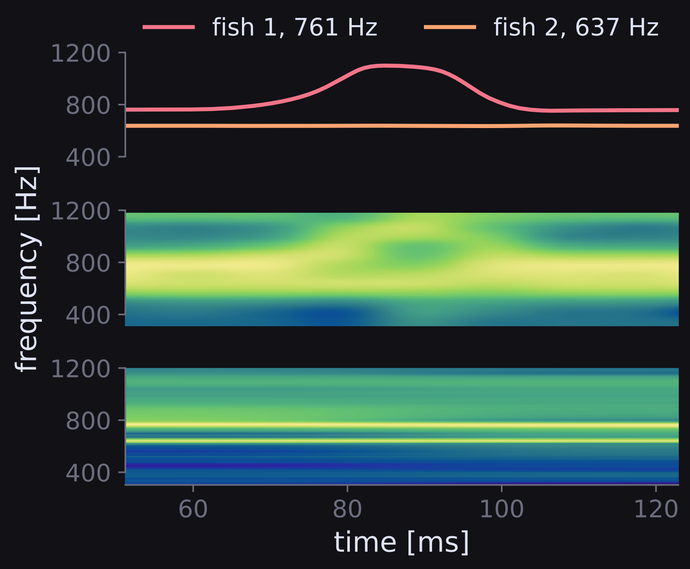
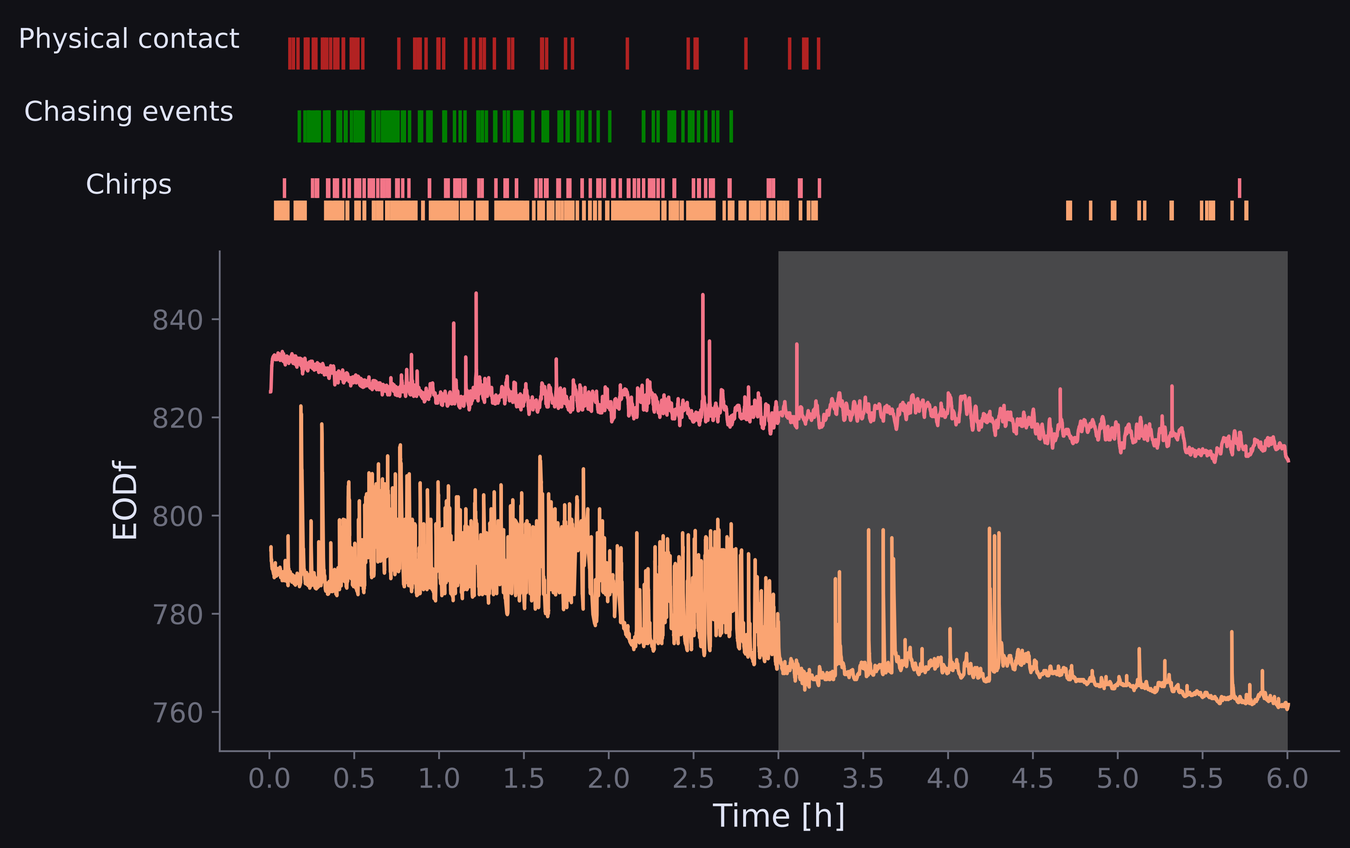
## Introduction

The time-frequency tradeoff makes reliable signal detecion and simultaneous sender identification of freely interacting individuals impossible. This profoundly limits our current understanding of chirps to experiments with single - or physically separated - individuals.

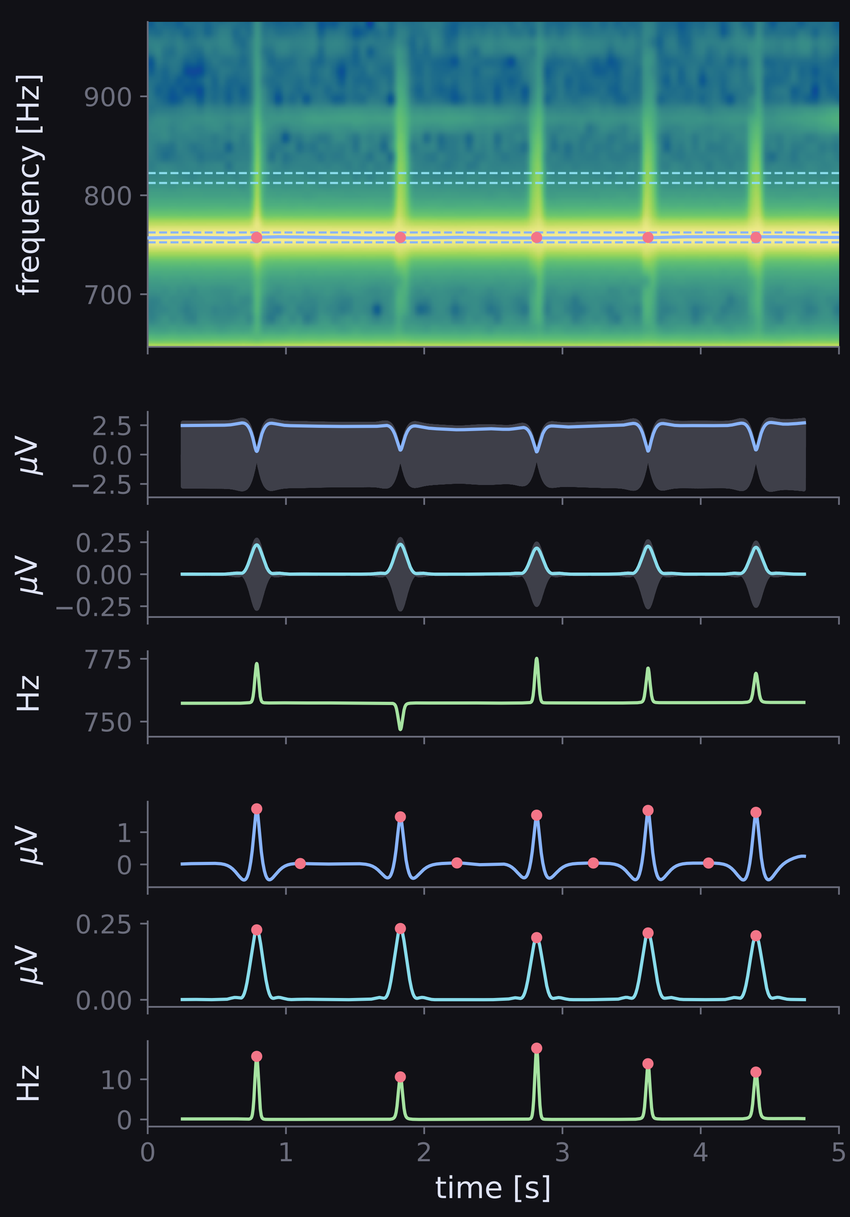


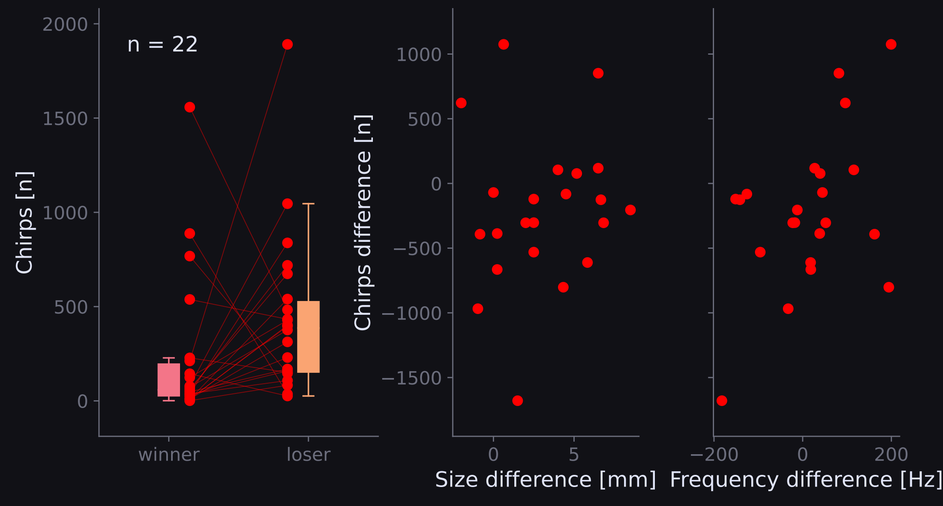

## Chirps during competition




- Two fish compete for one hidding place in one tank,
- Experiment had a 3 hour long darkphase and a 3 hour long light phase.

## Chirp detection




- Fish who won the competition chirped more often than the fish who lost.
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## Interactions at modulations

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## 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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