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## POS-28 - A "two-peak" pattern observed in the high-frequency neural oscillations of a weakly electric fish

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Weakly electric fish produce a high-frequency oscillating electric field that allows them to navigate and communicate in the dark. Their clock-like signal is the least variable of any known biological oscillator, but the mechanisms underlying this extreme precision are not clear. We recorded electric discharges in Apteronotus albifrons (blackghost knifefish) at 50MHz sampling frequency to characterize temporal precision under different conditions, such as a varying temperature. We used three different approaches to analyse cycle-to-cycle variability: the first involved a simple signal threshold; the second was based on the signal envelope using Hilbert transforms; and the third, which was the most accurate, used the phase of the Hilbert transform. One important observation was that under certain conditions, the histogram of cycle periods exhibits two peaks. We hypothesize that the electric organs on the left and right sides of the fish are independent oscillators that normally are synchronized but can also operate separately under some conditions. We will discuss the implications of our results on the neural generation of high-frequency signals and the insight that it provides for brain oscillations in general.

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