LOCAL FIELD POTENTIAL -LFP RECORDING

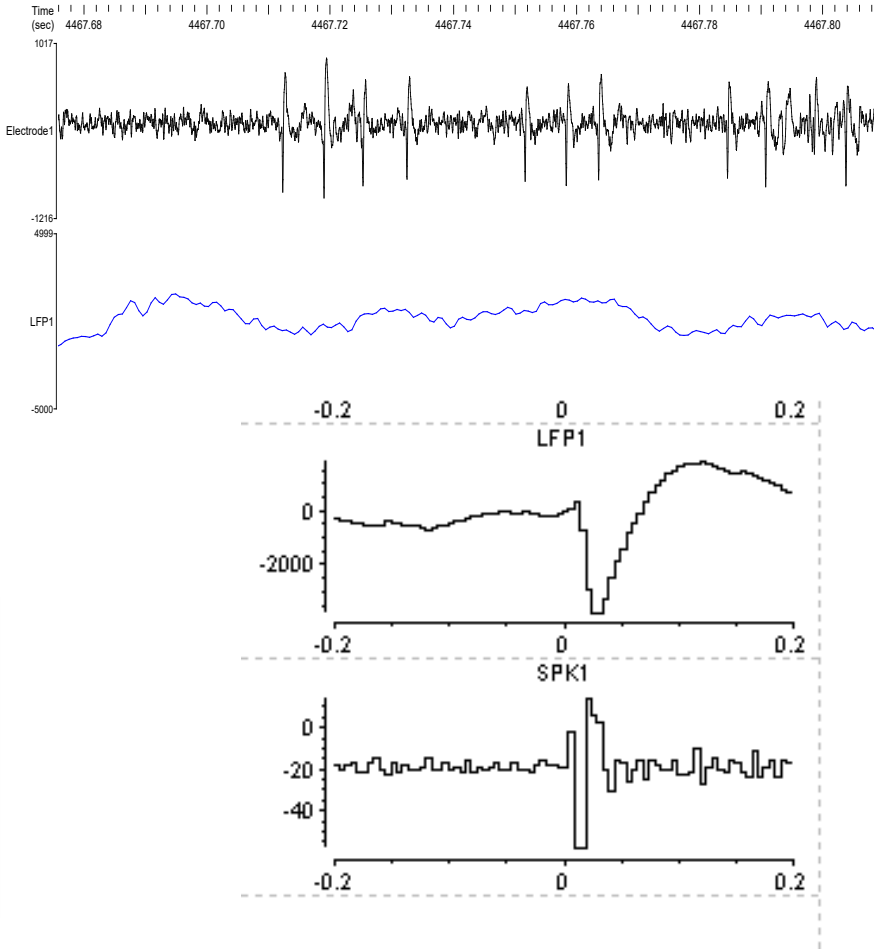
ALPHA omega

Defining Neuroscience Technology

LFP CAPABILITIES

What is LFP

- Measure the overall activity of an area rather than individual neurons
- Differentiate borders between quiet active areas
- Can detect correlation



LFP CAPABILITIES

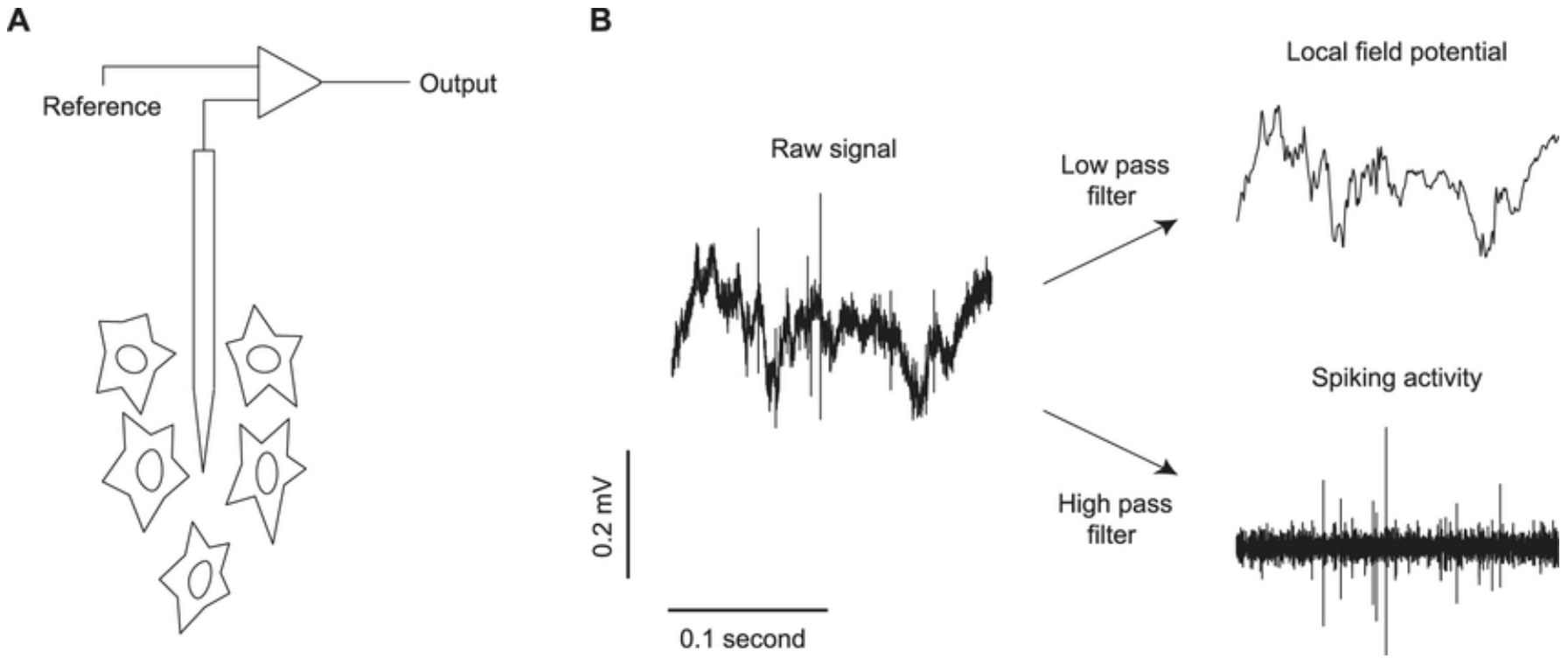
WHAT IS LFP

- Electrodes can measure cellular spiking activity whose spectrum occur near 1000 Hz as well as the **collective sum of potentials from multiple cells** near the electrode, the local field potential (LFP), usually occurring from 0.1 to 70 Hz

- The Local Field Potential (LFP) is the electric potential recorded in the extracellular space in brain tissue, typically using micro-electrodes (metal, silicon or glass micropipettes). LFPs are recorded in depth, from within the cortical tissue (or other deep brain structures).

LFP CAPABILITIES

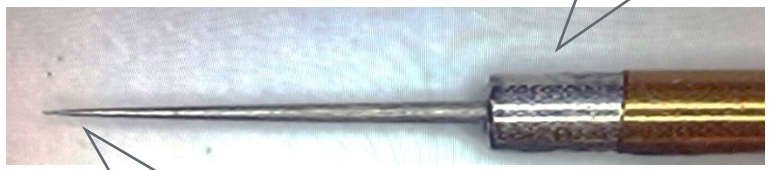
Recording LFP from AO electrodes



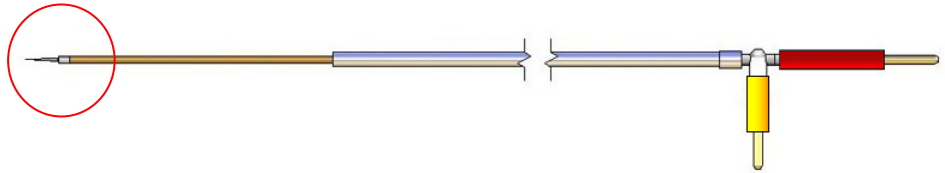
LFP CAPABILITIES

Frequency response

MACRO TIP
- Record LFP (0.075Hz-300Hz)
- Macro Stimulation up to 7mA



Zoom In

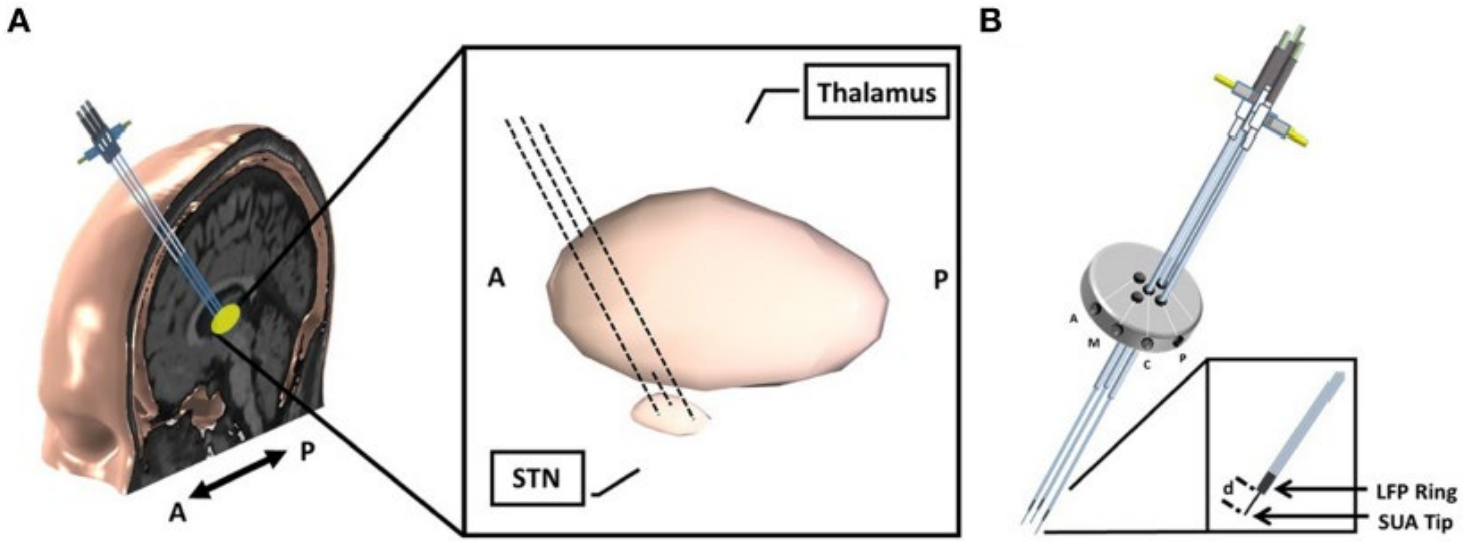


MICRO TIP

Record Spikes (300Hz-9000Hz)
- Record RAW (0.075Hz-9000Hz)
- Record LFP (0.075Hz-300Hz)
- Micro Stimulation up to 100uA

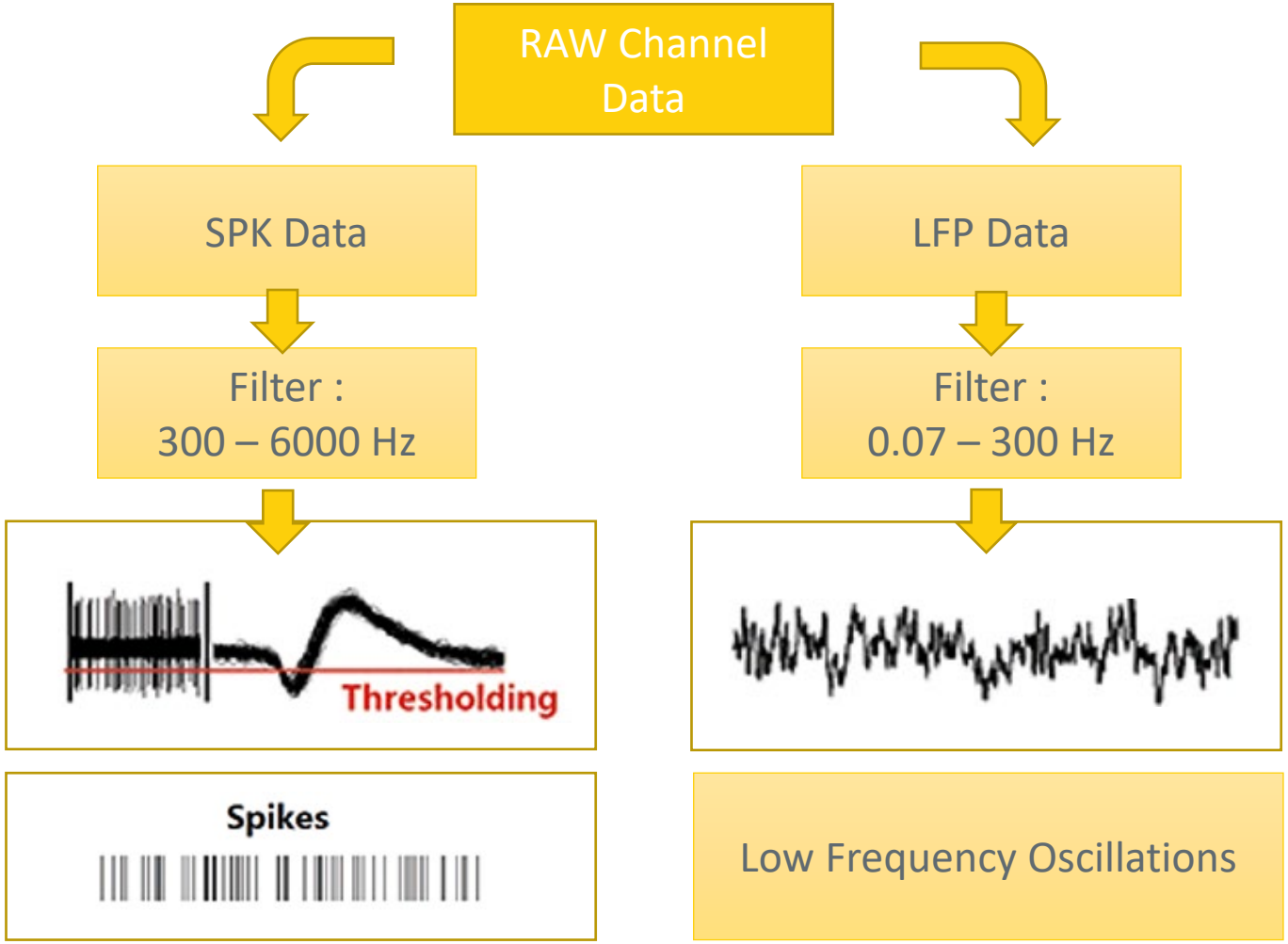
LFP CAPABILITIES

Recording LFP from AO electrodes

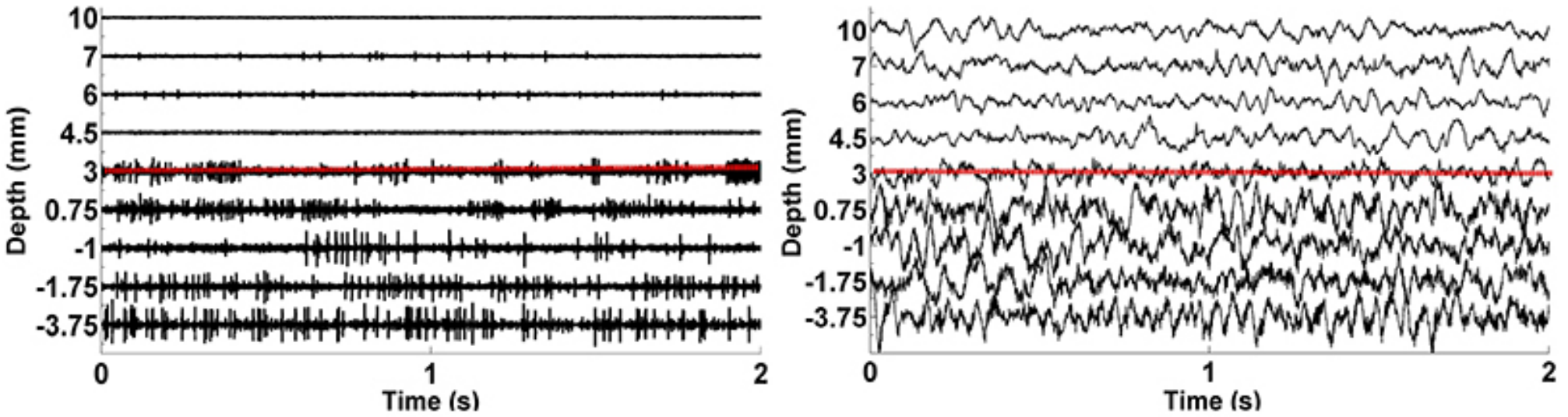


LFP CAPABILITIES

RAW data



LFP CAPABILITIES



Prediction of STN-DBS Electrode Implantation Track in Parkinson's Disease by Using LFP
Ilknur Telkes , Joohi Jimenez-Shahed, Ashwin Viswanathan, Aviva Abosch and Nuri F.Ince

LFP CAPABILITIES

- Reliable correlations between motor symptoms and components of the LFP power spectrum suggested that LFPs may serve as biomarker for movement disorders
- LFPs are composite signals divided into a number of frequency bands, as follows:
  - 0–3 Hz (delta), 4–7 Hz (theta),
  - 8–12 Hz (alpha), 13–30 Hz (beta), 31–200 Hz (gamma), and >200 Hz (high frequency).

Table 1. LFP frequency-based classification system

Frequency band	Range, Hz
Delta	0–3
Theta	4–7
Alpha	8–12
Beta	13–30
Gamma	31–200
High frequency	>200 Hz

LFP CAPABILITIES

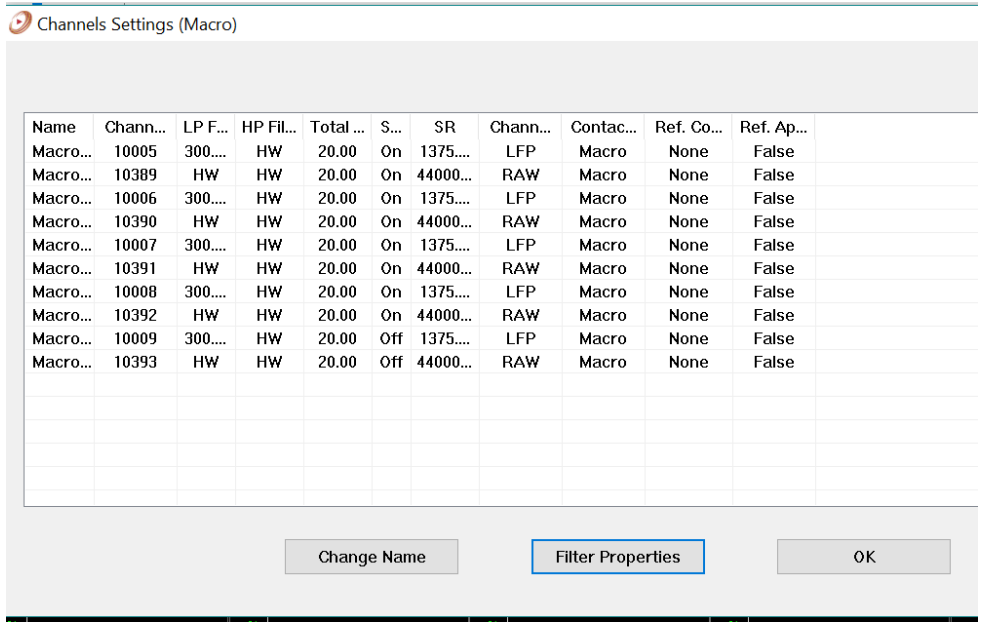
Neuro Omega system -SETTINGS

- Neuro Omega can record LFP data from Micro and Macro contact of the electrode as well as EEG, EMG and ECOG

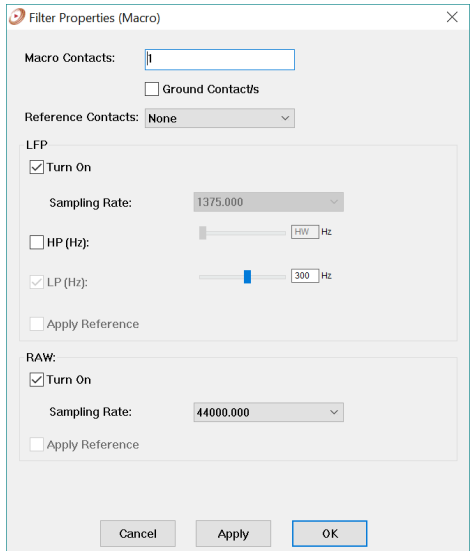
Default filters are : 0.07-300Hz

Sampling rate :1375 Hz

CHANNEL SETTINGS



FILTER PROPERTIES



LFP CAPABILITIES

Neuro Omega system –RELEVANT WINDOWS

Macro LFP

Color Density Spectrogram