Quick Guide

elements
enabling technologies for Life Science

eLab

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Revision History

Date	Version	What's new
19/02/2026	0.1.0	New document format

Introduction

eLAb is a framework for electrophysiology data analysis.

At its core, **eLab** is text based. This design allows users user to concatenate operations on datasets in a fast, repeatable and transparent way. By composing simple command strings, complex analysis pipelines can be built and reused with minimal effort.

All available commands are described in the sidebar, which is easily accessible within the interface. Each command is represented by a minimal, copy-pastable string that can be inserted directly into the editor, making workflow construction quick and intuitive.

Every operation — or concatenation of operations — is automatically displayed as a plot.

In addition to the graphical output, relevant metadata and statistical information are shown at the bottom of the screen. For example, simply opening an .abf file will display:

- The sampling rate
- The mean of the signal
- The standard deviation of the signal

This immediate feedback allows users to quickly inspect both the visual and quantitative properties of their data before proceeding with further analysis.

Concepts

Data source

Programmatically represented as **ds<>**, a **data source** is an operator which takes an .abf file as input and extracts its relevant informations.

A data source can contain:

- A single type of data (e.g., current in Ampere)
- Two types of data (e.g., current in Ampere as readout and voltage as stimulus)

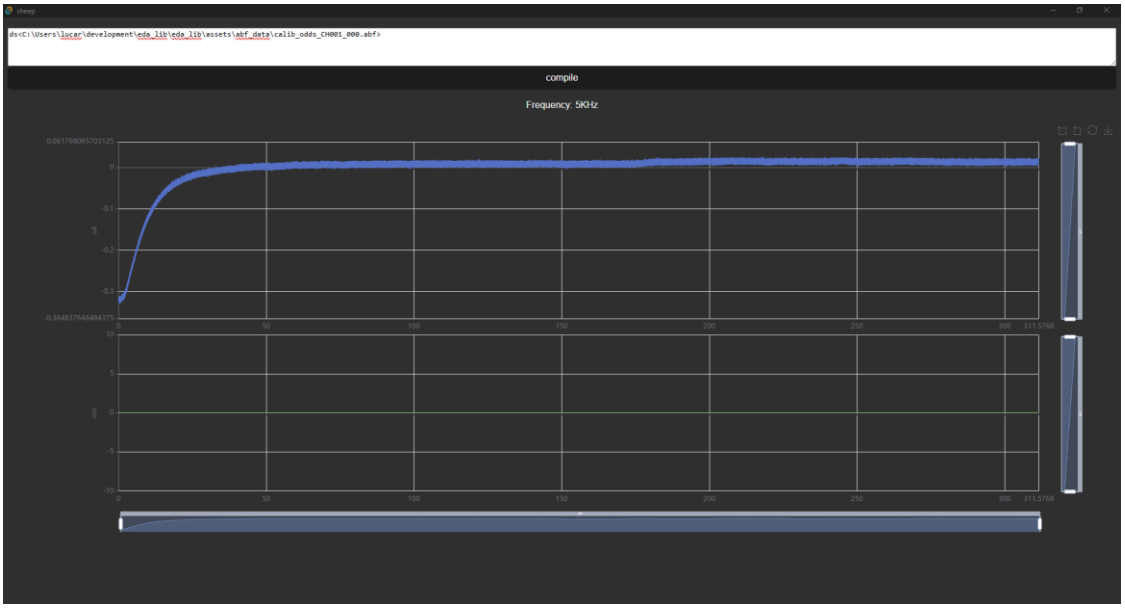
The data source concept is central to eLAb's architecture. Certain operations are only permitted on specific types of data sources, ensuring that analyses remain logically consistent and semantically valid.

It is now possible to open:

- Single gapfree abf: path to the specific abf
- Single episodic abf: path to the specific abf
- Multiple gapfree abf: if the abf are all in the same folder, path to the folder

Data visualization

GapFree Data



Episodic Data

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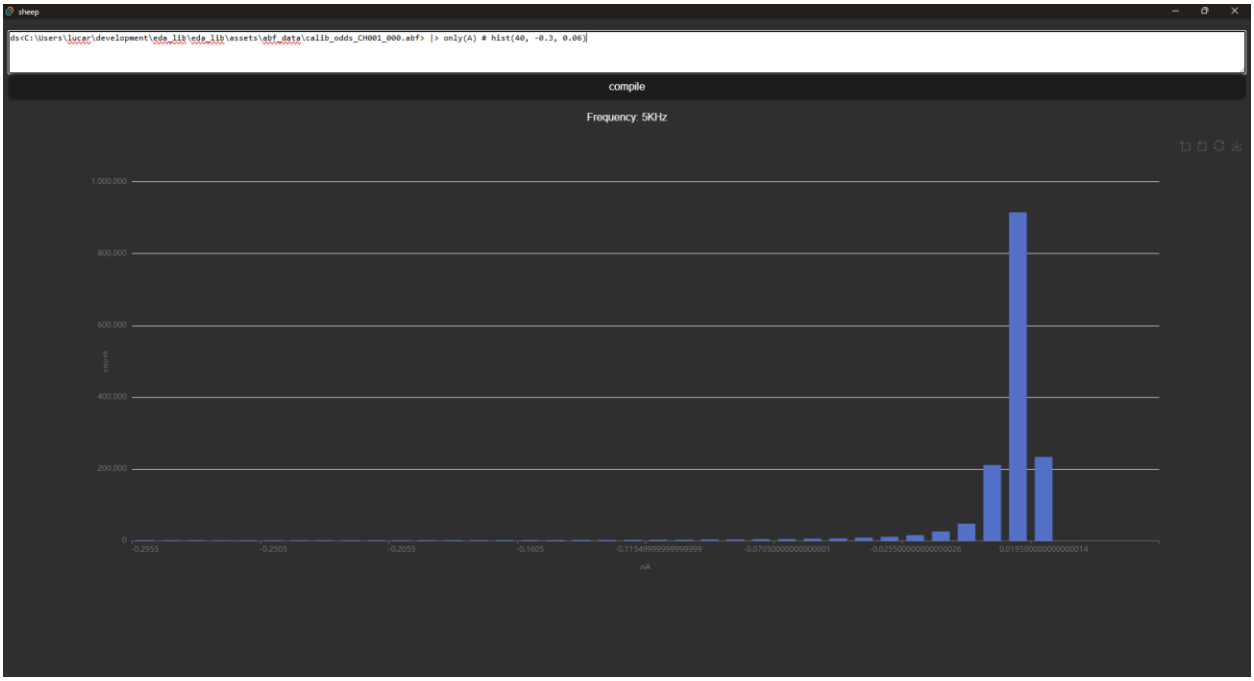
Analysis

eLab enables scientists to perform multiple kinds of analysis with a data centric approach.

Histogram

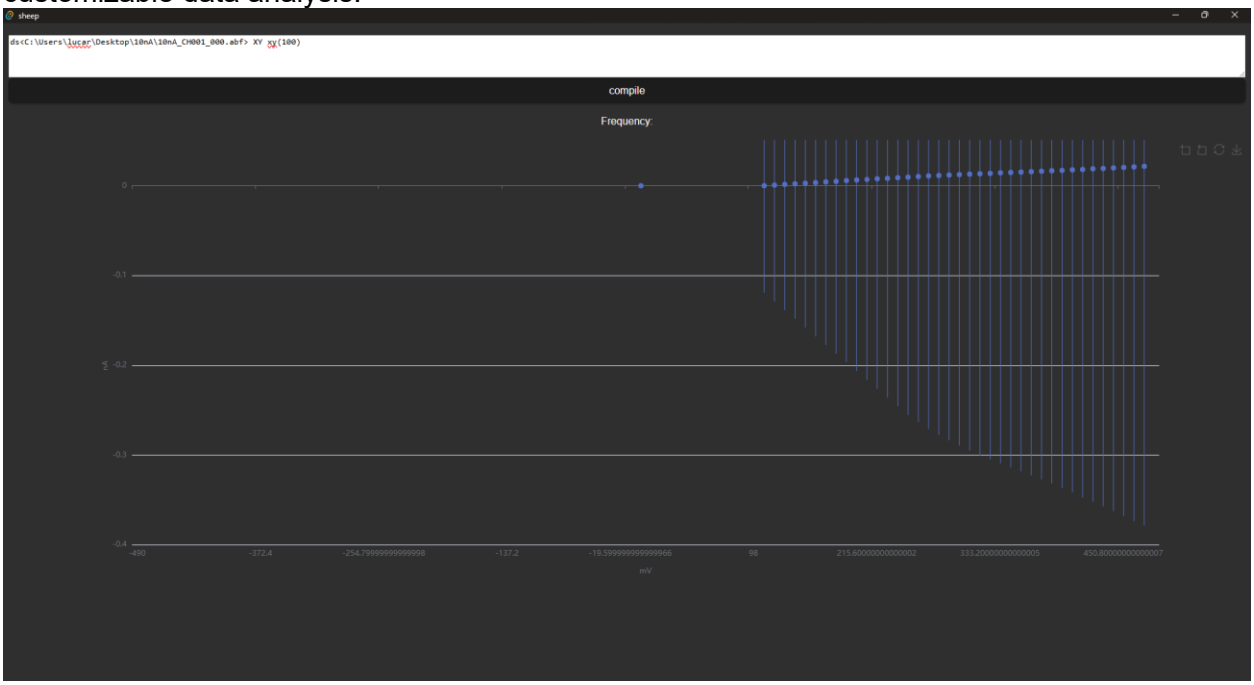


XY Graph

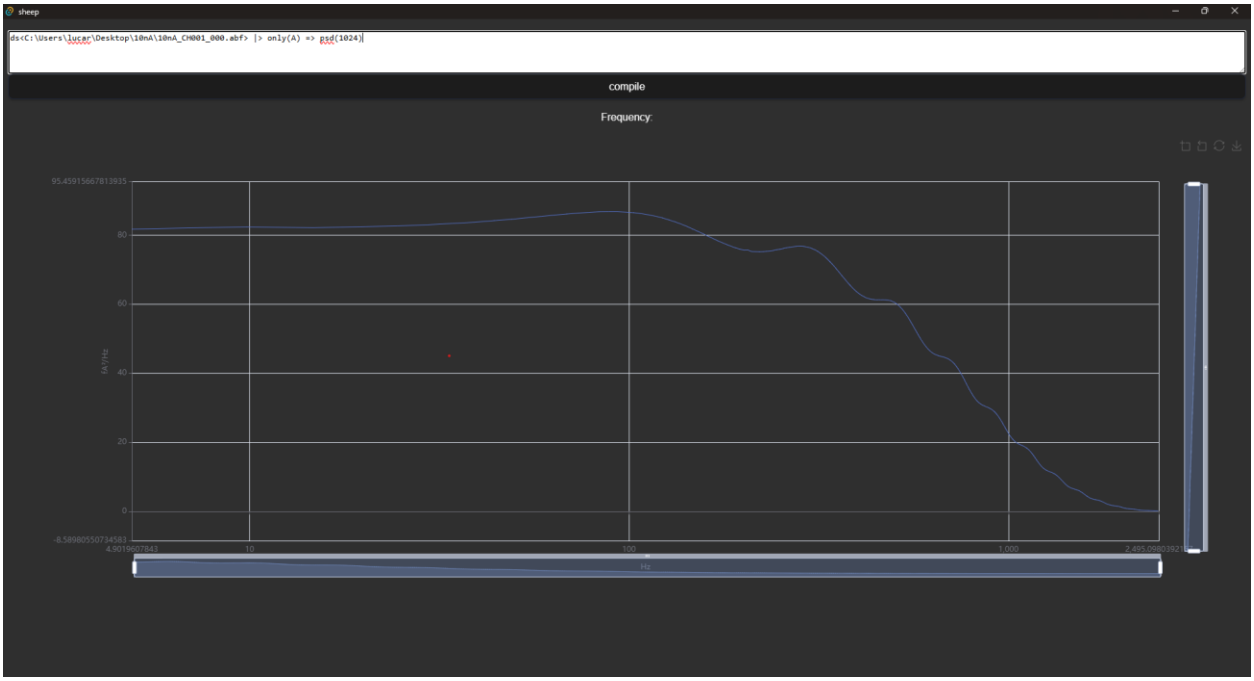
XY graphs represent a generalized form of I/V graphs.

In eLAb, users can freely choose which variables to plot against each other. This flexibility allows the creation of standard I/V (current vs. voltage) plots, as well as V/I (voltage vs. current) plots or any other valid variable combination available in the dataset.

This generalized approach removes rigid plotting constraints and enables more exploratory and customizable data analysis.



Psd



And much more..

- Capable of displaying and analyzing both gap-free and episodic data *(Event-based data support coming soon)*
- Designed to efficiently handle large datasets
- Support for any data type, not limited to current and voltage
- Arithmetic operations between channels
- Signal filtering (arbitrary-order Butterworth low-pass filters)
- Time restriction (analysis on a selected subset of the data)
- Low memory footprint
- High-performance computations powered by a Rust backend
- Data export in csv for easy sharing, including:
    - Entire datasets
    - Selected portion of datasets
    - Aggregated measurements

And many more analyses features are coming soon.

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