Dataset II – description
December 19, 2019

All data in Dataset II are available under the Allen Institute Terms of Use.

This dataset consists of simultaneously measured fluorescence ("Ophys") and electrophysiological ("Ephys") activity of pyramidal neurons in layer 2/3 of primary visual cortex in transgenic mouse lines expressing genetically-encoded calcium indicators GCaMP6s or GCaMP6f. The dataset contains 50 individual recordings from 35 distinct neurons across 3 distinct genotypes.

Genotype	GECI	Acronym	Number of neurons (recordings)	
			Huang, et. al. [13]	Analyzed in this work
Emx1-IRES-Cre;Camk2a-tTA;Ai94	GCaMP6s	Emx1-s	32 (32)	15 (19)
Emx1-IRES-Cre;Camk2a-tTA;Ai93	GCaMP6f	Emx1-f	26 (26)	9 (14)
Cux2-CreERT2;Camk2a-tTA;Ai93	GCaMP6f	Cux2-f	27 (27)	11 (17)
Total			85 (85)	35 (50)

Calcium imaging was performed at high optical zoom focused on individual cells, and the data was spatiotemporally resampled to match the data quality (noise profile) typical of the Allen Brain Observatory. This dataset is described in Ledochowitsch et al., "On the correspondence of electrical and optical physiology in *in vivo* population-scale two-photon calcium imaging." [Publication].

The data are available for download in HDF5 format. Each HDF5 contains data for an individual simultaneous recording as listed below.

Variable name	Data type	Description	Unit
dff	1D-array (float64)	$\Delta F/F_0$	1
dte	scalar (float64)	Ephys sampling period (1/sampling rate)	sec
dto	scalar (float64)	Ophys sampling period (1/sampling rate)	sec
ephys_baseline_subtracted	1D-array (float64)	cell-attached membrane voltage - baseline	V
ephys_raw	1D-array (float64)	cell-attached membrane voltage	V
genotype	string	Full genotype of transgenic mouse	n/a
quiroga	scalar (float64)	Spike detection threshold	V
sptimes	1D-array (float64)	Detected spike times in units of seconds	sec

Loading the $\Delta F/F_0$ data in Python (example for recording 103991.h5):

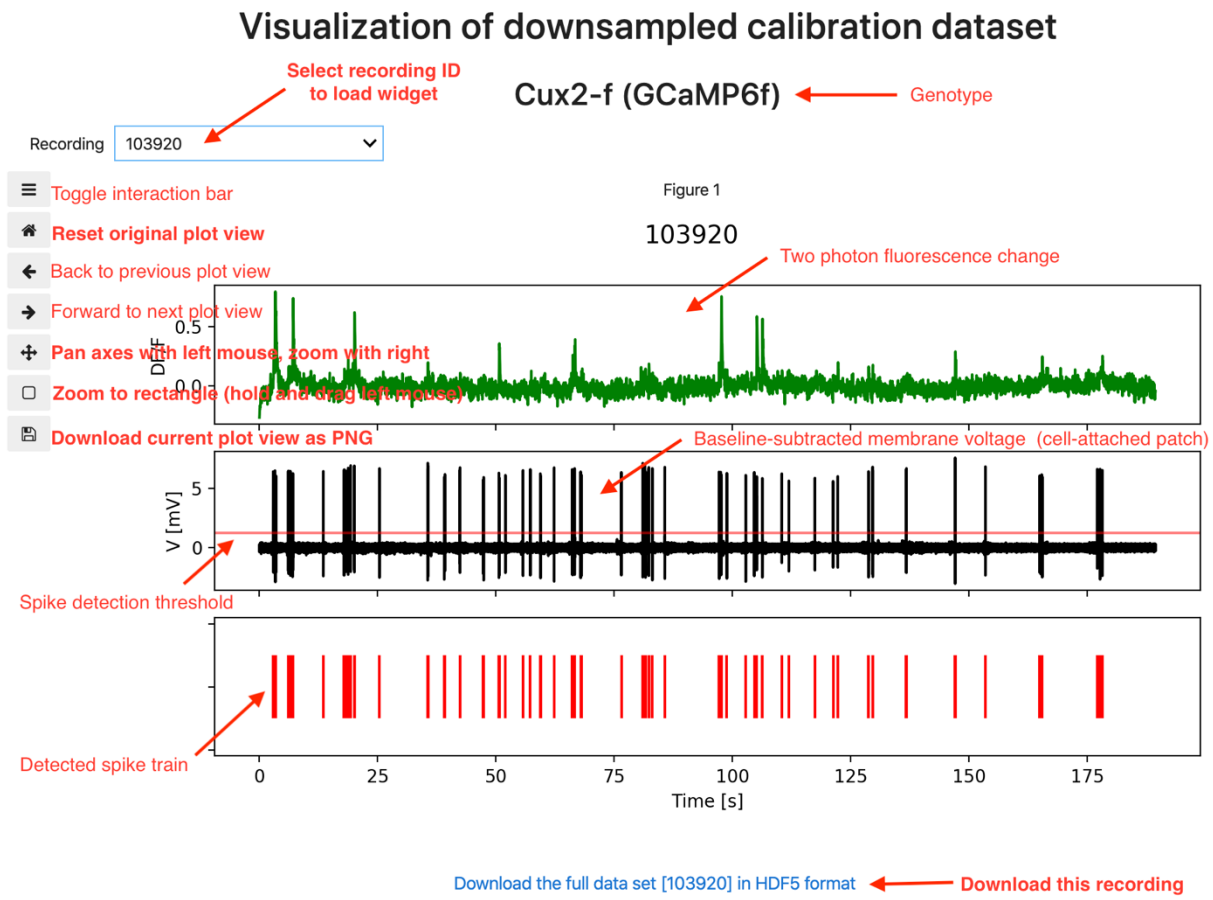
```
import h5py

dff = h5py.File('103991.h5', 'r')['dff']
```

Loading the $\Delta F/F_0$ data in Matlab (example for recording 103991.h5):

```
dff = h5read('103991.h5', '/dff');
```

An Online Data Browser, available via mybinder.org, facilitates visual exploration of Dataset II (recording selection, zoom, pan, etc.) as well as the download of plots and data for individual recordings.



Emx1-f (GCaMP6f)

Recording 102978

Loading widget...

Download the full data set [102978] in HDF5 format

Emx1-s (GCaMP6s)

Recording 102525

Loading widget...

Download the full data set [102525] in HDF5 format

```
<function __main__.oephys_plot(Recording)>
```