This datasets contains 60 trials of widefield imaging data from an awake mouse, during a visual mapping experiment. The widefield data was acquired in a transgenic animal, expressing GCaMP6s under the PlexinD1 promotor (in excitatory, cortico-cortical and cortico-striatal projection neurons).

The animal ID in this recording is Plex66 (variable ‘Animal’ in some functions).

The visual stimulation setup was controlled by a Matlab-based visual stimulation system. Mail to simon.musall@gmail.com if you would like to use this code or have any questions. Otherwise, you can also check the protocol by Juavinett et al., that explains how to perform visual phase mapping experiments: https://www.nature.com/articles/nprot.2016.158

The framerate of the dataset is 60Hz, with the excitation light switching between blue and violet light on every frame. This leads to an effective framerate of 30Hz with blue excitation light, which can be corrected for intrinsic fluorescence by re-scaling and subtracting frames with violet exposure light.

Each trial contains 3 seconds of pre-stimulus data until the visual stimulus was presented. Subsequently, each trial contains at least 22 seconds of post-stimulus data.

This dataset is intended as a raw data example for the Matlab function 'computePhaseMapsRaw.m'. The function can be found here: <https://github.com/musall/WidefieldImager/tree/master/Analysis>

The computePhaseMapsRawshows how to load dual-wavelength imaging data and compute visual phase maps based on analysis of invidual pixels.

Note that due to the large size of individual trials, processing will some time (~15-30 minutes) when performing hemodynamic correction.

The repository also contains two alternative versions to compute phase maps from low-dimensional data:

'computePhaseMapsRawNCAAS’ can be used to compute phasemaps after using the cloud-based Neurocaas pipeline (<https://github.com/jcouto/wfield/blob/master/usecases.md>). Here, the folder only needs to contain the NeuroCAAS result files ‘U\_atlas.npy’ and ‘SVTcorr.npy’ instead of raw imaging data. The function will generate a phasemap from the imaging data and also show the averaged imaging data over all trials to show the rythmic visual responses in posterior cortex.

‘computePhaseMaps’ can also be used to create phasemaps from locally created low-D data. This code can be used when using the Matlab-based dimensionality pipeline. For more details see‘Tutorial\_dimReduction.m’ in the same folder as ‘computePhaseMaps.m’