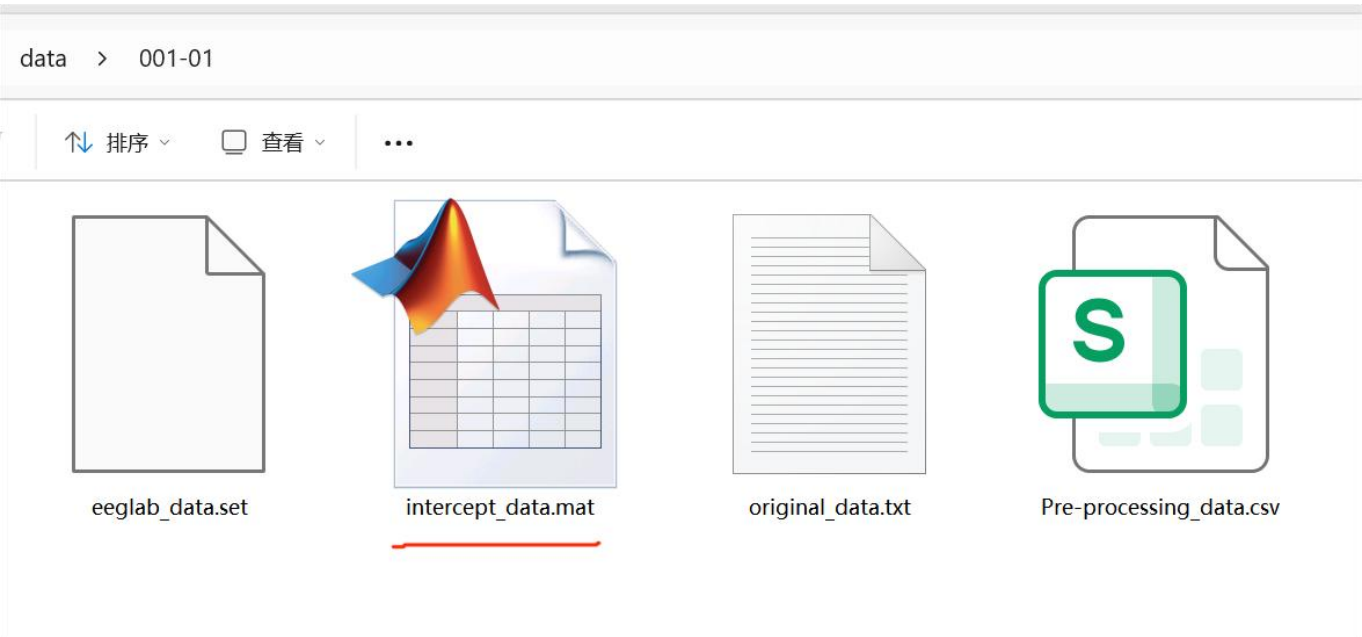


1. 安装 eeglab2024.2.zip: EEGLAB 工具箱安装包，是一款基于 MATLAB（部分支持 Octave）的开源脑电图（EEG）数据处理分析工具箱，广泛应用于神经科学研究。该工具支持多种主流 EEG 数据格式导入，并提供从预处理到高级分析的完整流程。
2. 使用 Matlab，运行 eeglab 并选择以下选项



3.将 intercept_data.mat 文件导入，并设置采样率为 250Hz



Import dataset info -- pop_importdata()

Data file/array (click on the selected option)

Matlab .mat file

d:\Learn-EEG\data\001-01\intercept_data.r

Browse

Dataset name

Data sampling rate (Hz)

250

Time points per epoch (0->continuous)

0

Start time (sec) (only for data epochs)

0

Number of channels (0->set from data)

0

Ref. channel indices or mode (see help)

Subject code

Task condition

Session number

Subject group

About this dataset

Enter comments

Channel location file or info

(note: autodetect file format using file extension; use menu "Edit > Channel locations" for more importing options)

ICA weights array or text/binary file (if any):

ICA sphere array or text/binary file (if any):

From other dataset

Browse

From other dataset

Browse

From other dataset

Browse

Help

Cancel

Ok

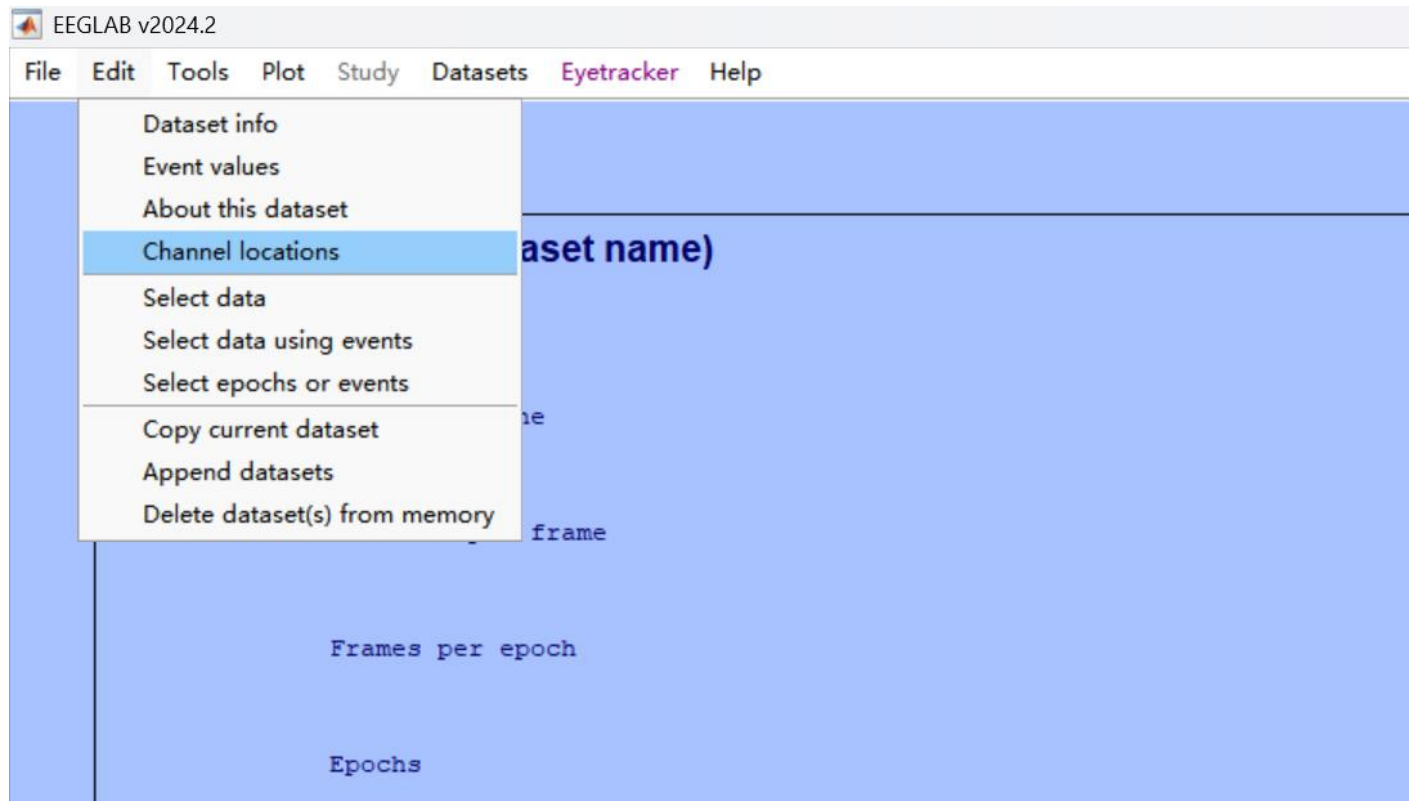
4.显示如图画面

EEGLAB v2024.2

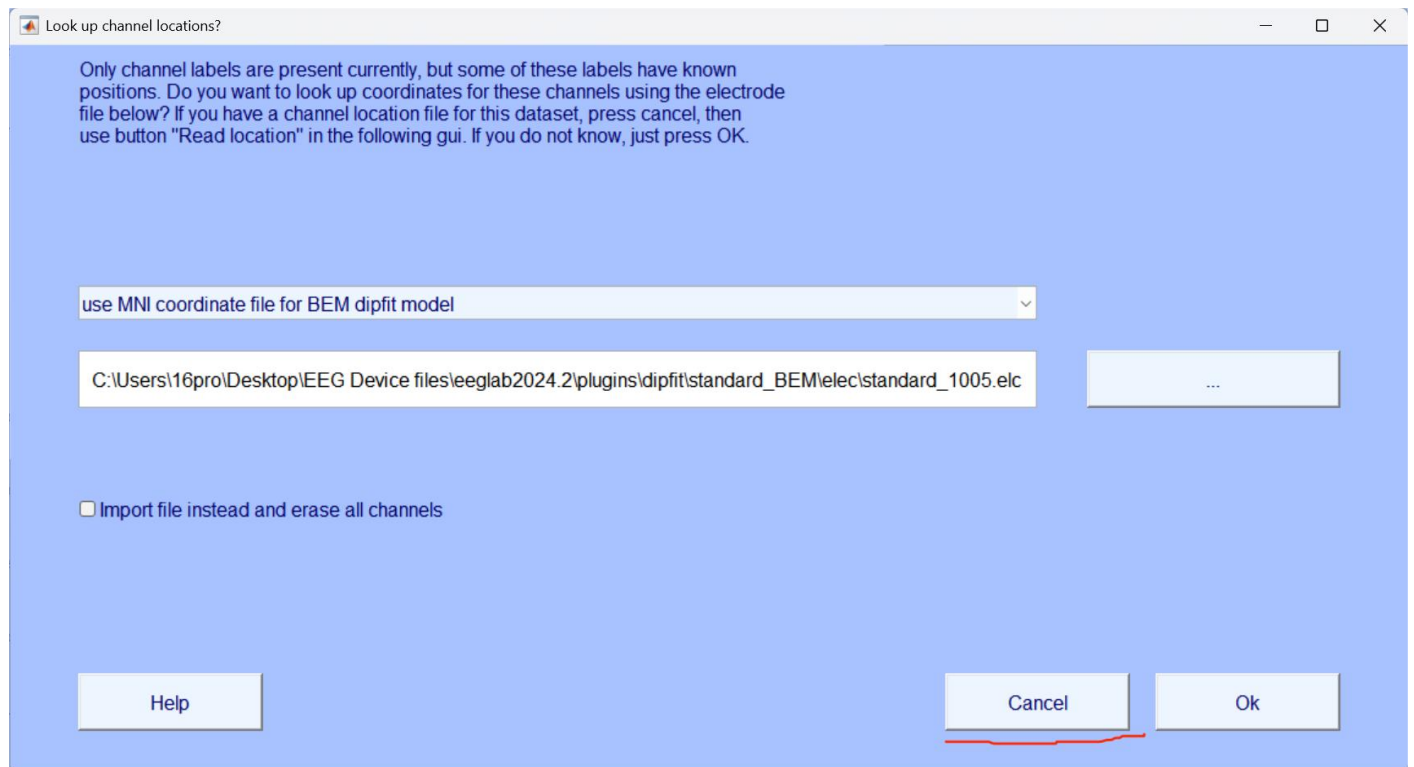
File Edit Tools Plot Study Datasets Eyetracker Help

#1: (no dataset name)	
Filename:	none
Channels per frame	16
Frames per epoch	180000
Epochs	1
Events	none
Sampling rate (Hz)	250
Epoch start (sec)	0.000
Epoch end (sec)	719.996
Reference	unknown
Channel locations	No
ICA weights	No
Dataset size (Mb)	13

5.选择以下按钮，确定电极位置



6.按照次序选择 custom_16_electrodes.sfp 文件,就确定好了电极位置。



Edit channel info -- pop_chanedit()

Channel information ("field_name"):

Channel label ("label")	E1	Opt. head center
Polar angle ("theta")		Rotate axis
Polar radius ("radius")		Transform axes
Cartesian X ("X")		
Cartesian Y ("Y")		Xyz -> polar & sph.
Cartesian Z ("Z")		Sph. -> polar & xyz
Spherical horiz. angle ("sph_theta")		Polar -> sph. & xyz
Spherical azimuth angle ("sph_phi")		
Spherical radius ("sph_radius")		Set head radius
Channel type		Set channel types
Reference		Set reference
Index in backup 'urchanlocs' structure		
Channel in data array (set=yes)	<input checked="" type="checkbox"/>	

Delete chan

Channel number (of 1)

Insert chan << < 1 > >> Append chan

Plot 2-D Plot radius (0.2-1, []=auto) Nose along +X Plot 3-D (xyz)

Read locations Read locs help Look up locs Save (as .ced) Save (other types)

☐ Overwrite Original Channels

Help Cancel Ok

custom_16_electrodes.sfp 2025/3/19 18:55 SFP 文件 1 KB

File format:

autodetect
Polhemus native .elp file
BESA spherical .elp file
Matlab .xyz file
BESA or EGI 3-D cartesian .sfp file
EEGLAB polar .loc file
Matlab .sph spherical file
Neuroscan polar .asc file
Neuroscan 3-D .dat file
ASA .elc 3-D file
EEGLAB complete 3-D file
BIDS .tsv file
Brainstorm Matlab file format
Fieldtrip layout file

Help Cancel Ok

Edit channel info -- pop_chanedit()

Channel information ("field_name"):

Channel label ("label")	Fp1	Opt. head center
Polar angle ("theta")	-18.4349	Rotate axis
Polar radius ("radius")	0.40251	Transform axes
Cartesian X ("X")	0.3	
Cartesian Y ("Y")	0.1	XYZ -> polar & sph.
Cartesian Z ("Z")	0.1	Sph. -> polar & xyz
Spherical horiz. angle ("sph_theta")	18.4349	Polar -> sph. & xyz
Spherical azimuth angle ("sph_phi")	17.5484	
Spherical radius ("sph_radius")	0.33166	Set head radius
Channel type		Set channel types
Reference		Set reference
Index in backup 'urchanlocs' structure	1	
Channel in data array (set=yes)	<input checked="" type="checkbox"/>	

☐ Overwrite Original Channels

7.成功会出现 Yes 标识

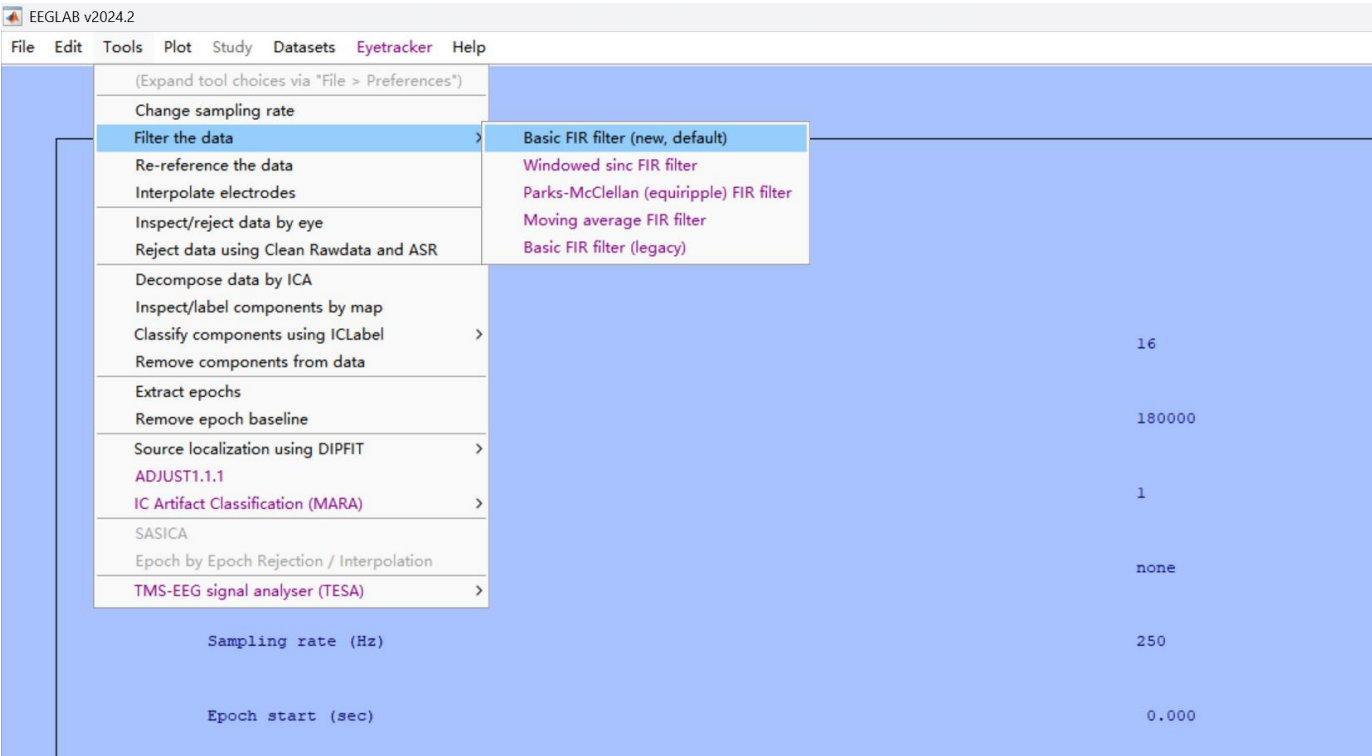
EEGLAB v2024.2

File Edit Tools Plot Study Datasets Eyetracker Help

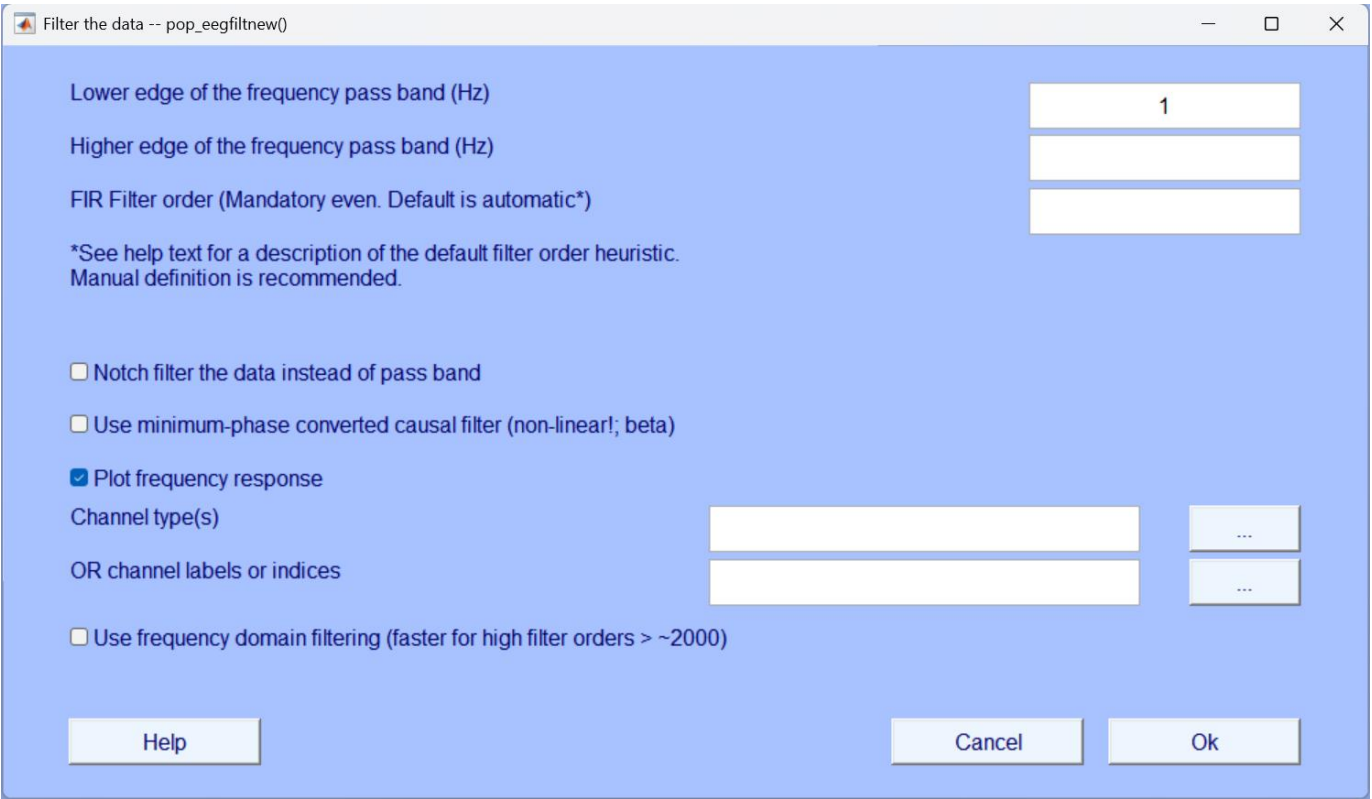
#1: (no dataset name)

Filename:	none
Channels per frame	16
Frames per epoch	180000
Epochs	1
Events	none
Sampling rate (Hz)	250
Epoch start (sec)	0.000
Epoch end (sec)	719.996
Reference	unknown
Channel locations	Yes
ICA weights	No
Dataset size (Mb)	13

8.进行滤波 1hz-75hz 的带通滤波，这里我们分开设置。



设置 1hz 的高通滤波



设置 75hz 的低通滤波

Filter the data -- pop_eegfiltnew()

Lower edge of the frequency pass band (Hz)

Higher edge of the frequency pass band (Hz)

FIR Filter order (Mandatory even. Default is automatic*)

*See help text for a description of the default filter order heuristic.
Manual definition is recommended.

☐ Notch filter the data instead of pass band

☐ Use minimum-phase converted causal filter (non-linear!; beta)

☒ Plot frequency response

Channel type(s)

OR channel labels or indices

☐ Use frequency domain filtering (faster for high filter orders > ~2000)

设置 50hz 的陷波，带宽 4hz，并勾选陷波

Filter the data -- pop_eegfiltnew()

Lower edge of the frequency pass band (Hz)

Higher edge of the frequency pass band (Hz)

FIR Filter order (Mandatory even. Default is automatic*)

*See help text for a description of the default filter order heuristic.
Manual definition is recommended.

☒ Notch filter the data instead of pass band

☐ Use minimum-phase converted causal filter (non-linear!; beta)

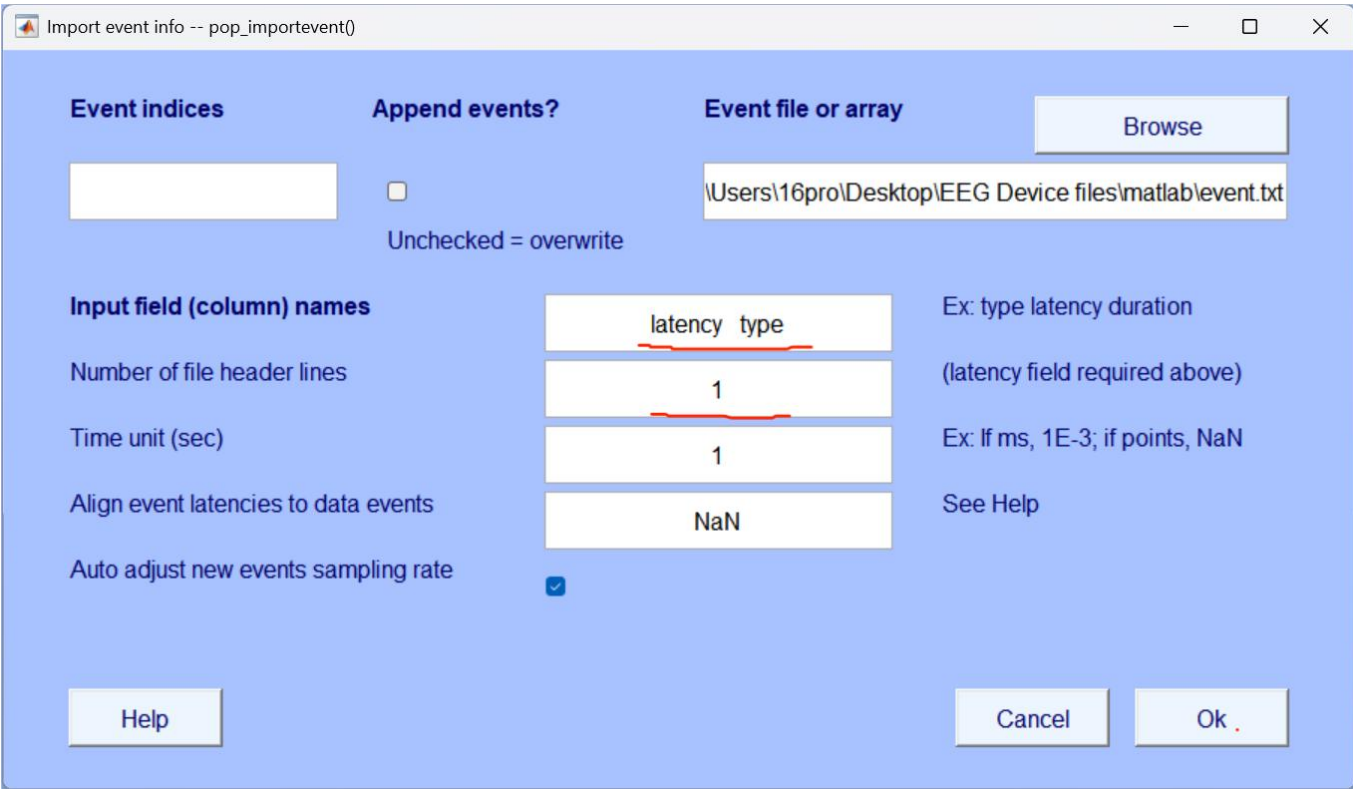
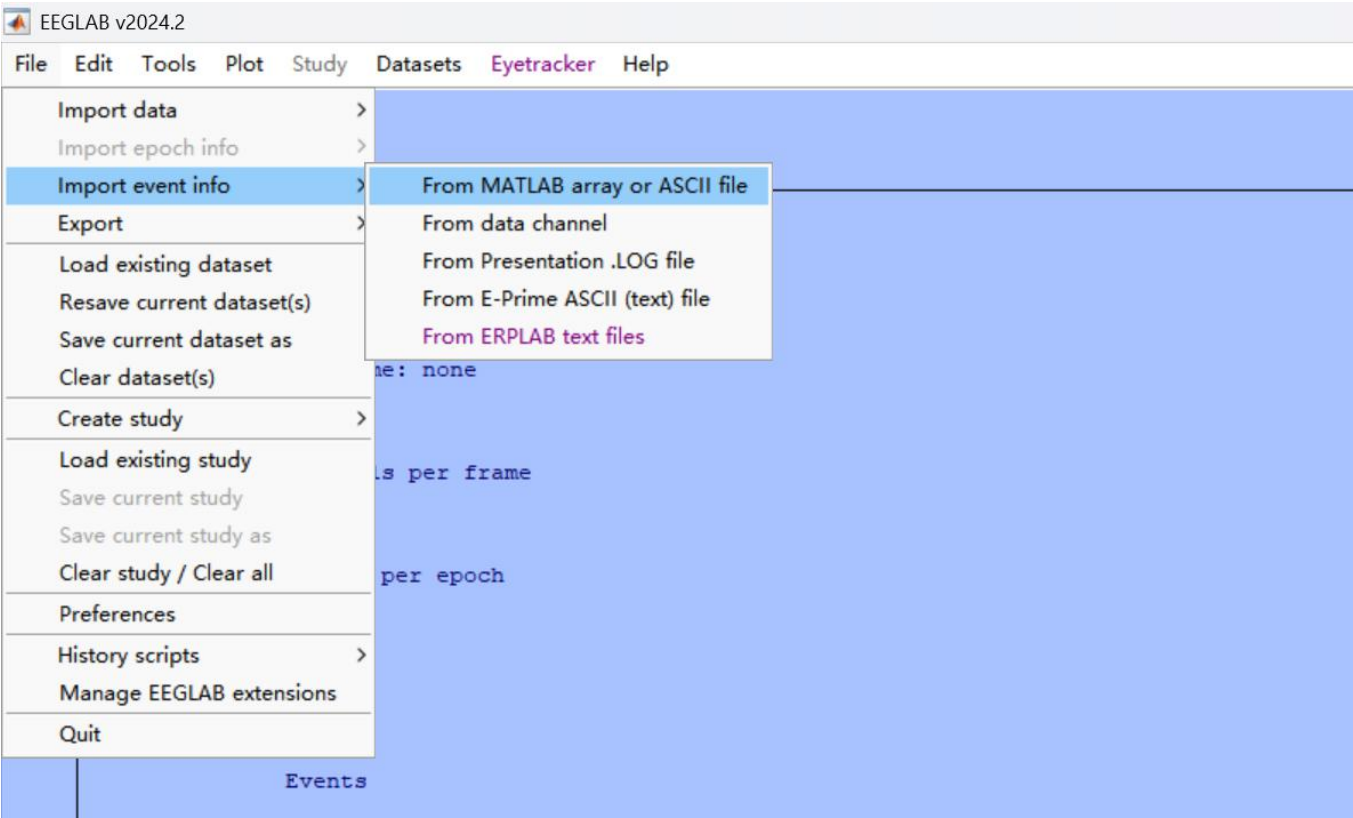
☒ Plot frequency response

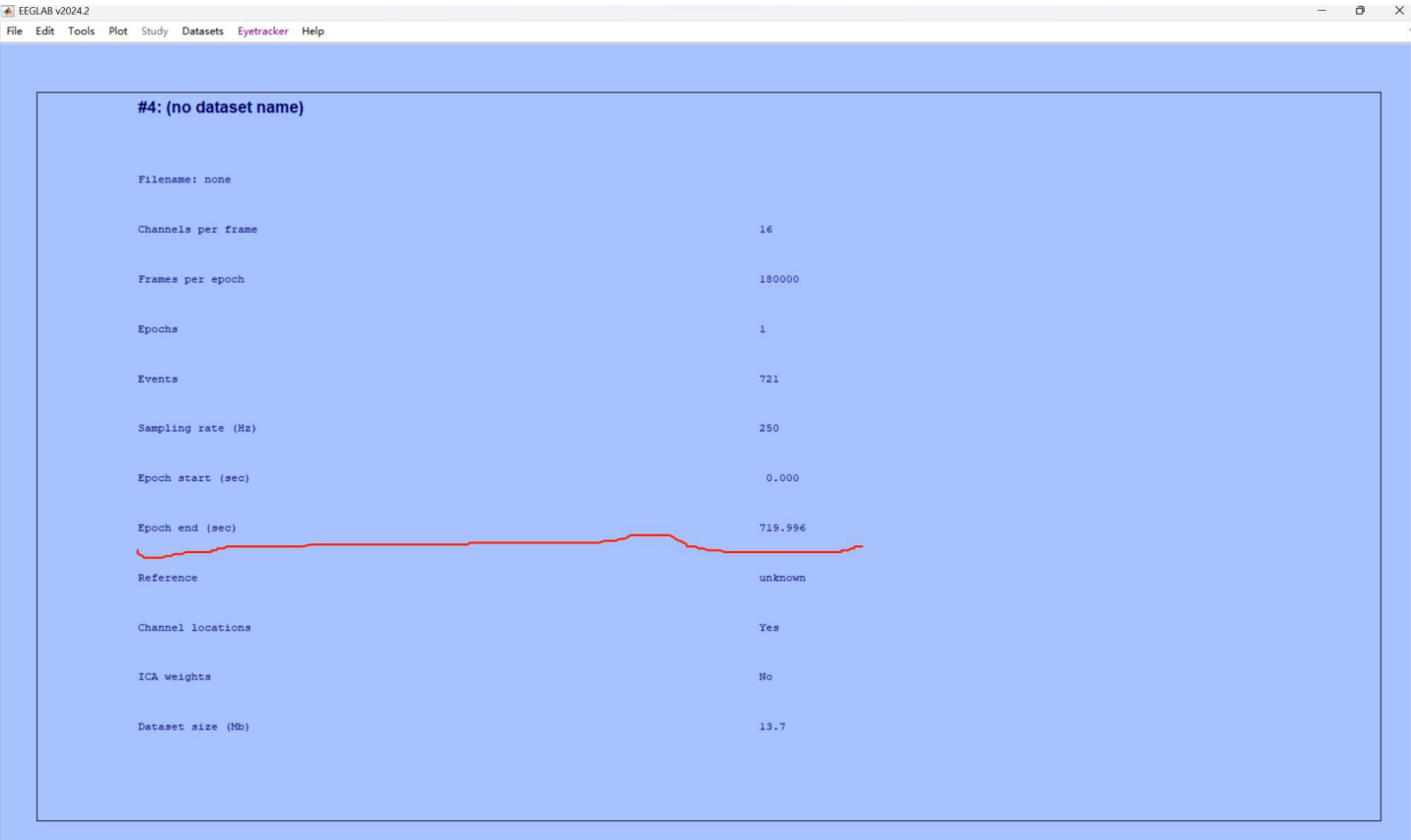
Channel type(s)

OR channel labels or indices

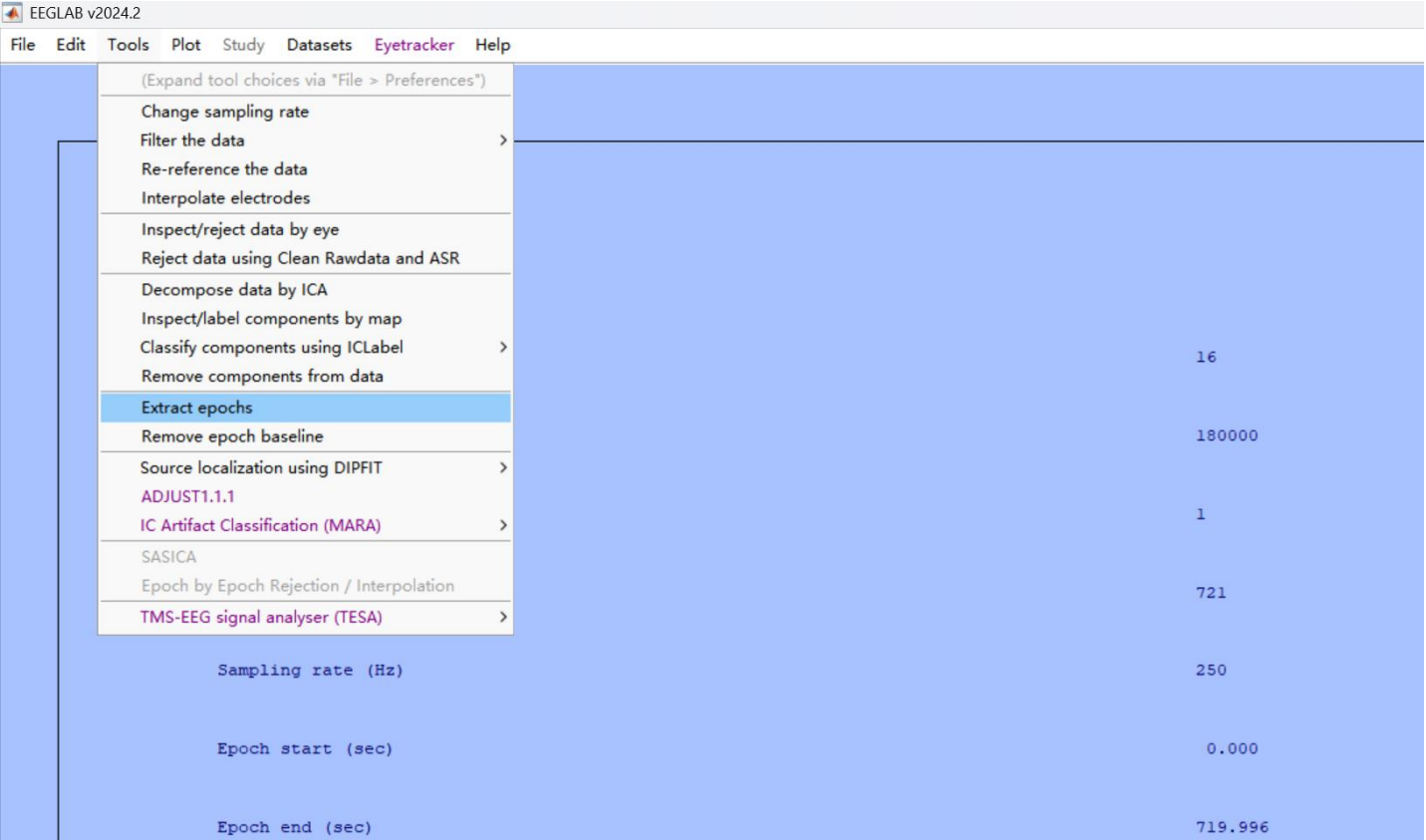
☐ Use frequency domain filtering (faster for high filter orders > ~2000)

9.事件的设置：导入事件文本





10.基线校正



Extract data epochs - pop_epoch()

Time-locking event type(s) ([]=all) ...

Epoch limits [start, end] in seconds

Name for the new dataset

Out-of-bounds EEG limits if any [min max]

11.现在我们可以筛选一下数据波形，将不好的数据进行删除。然后开始跑 ICA

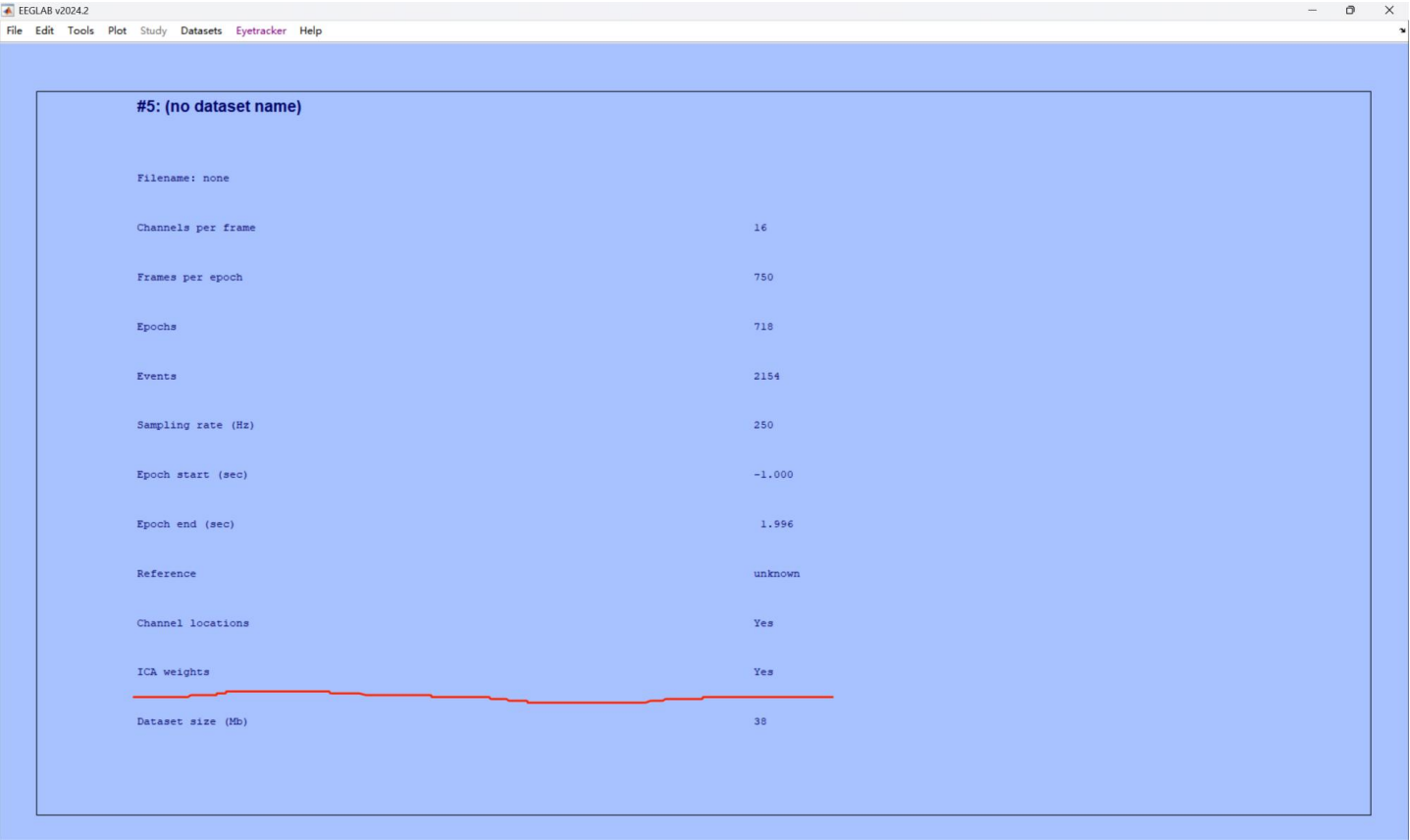
EEGLAB v2024.2

File Edit Tools Plot Study Datasets Eyetracker Help

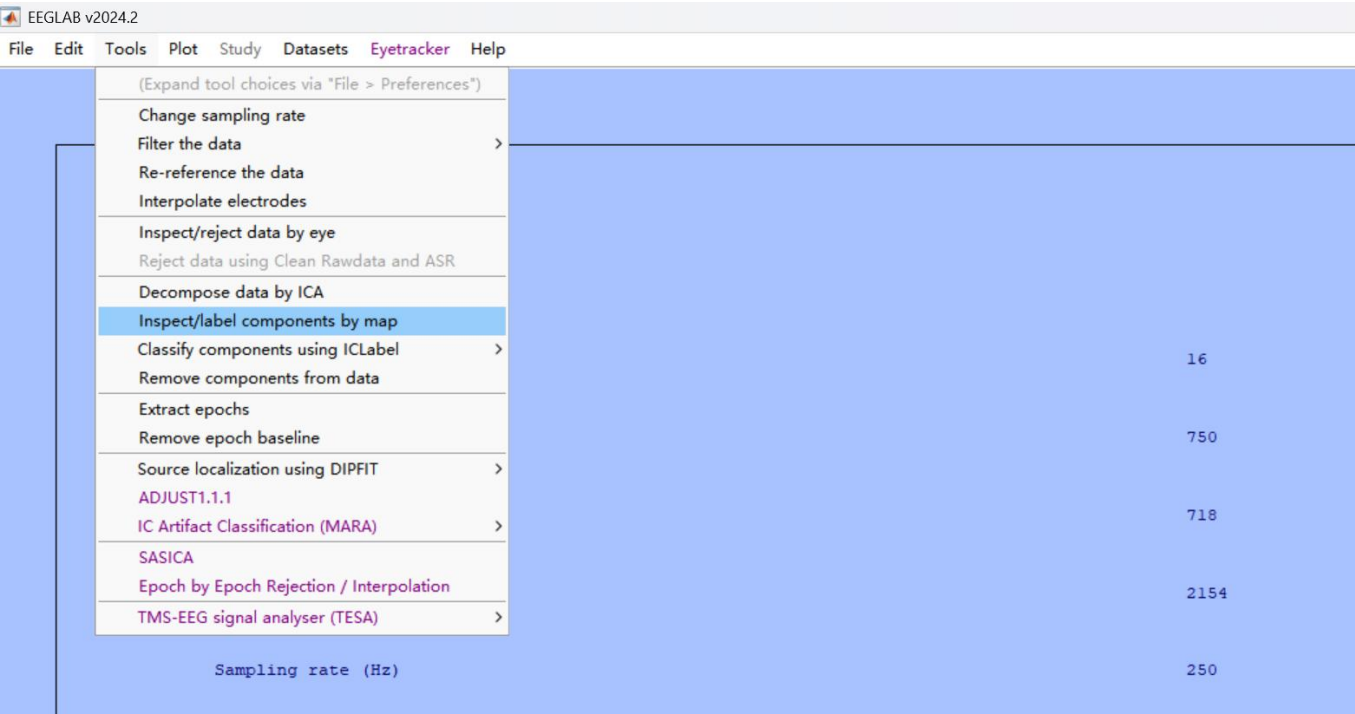
(Expand tool choices via "File > Preferences")

- Change sampling rate
- Filter the data >
- Re-reference the data
- Interpolate electrodes
- Inspect/reject data by eye
 - Reject data using Clean Rawdata and ASR
- Decompose data by ICA**
- Inspect/label components by map
- Classify components using ICLabel >
- Remove components from data
- Extract epochs
- Remove epoch baseline
- Source localization using DIPFIT >
- ADJUST1.1.1
- IC Artifact Classification (MARA) >
- SASICA
- Epoch by Epoch Rejection / Interpolation
- TMS-EEG signal analyser (TESA) >

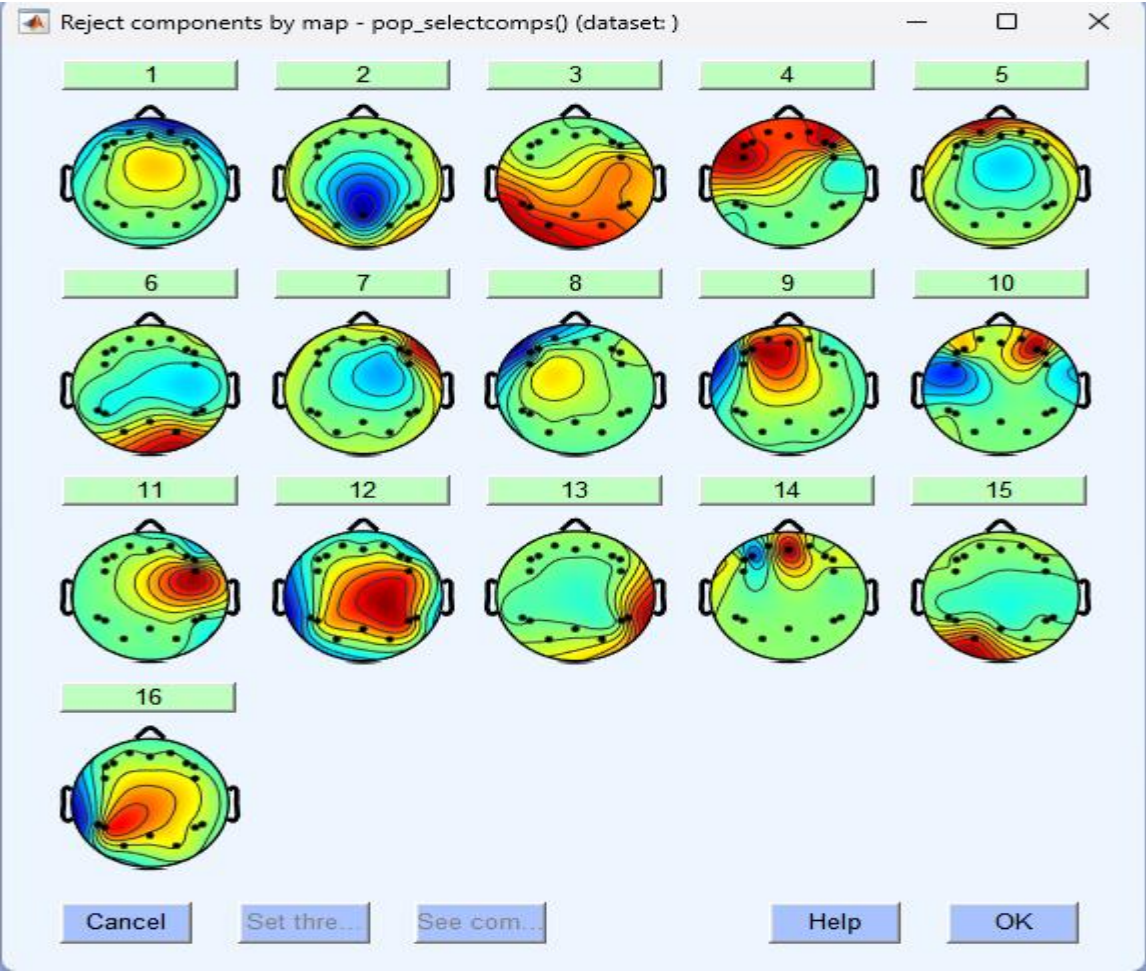
Sampling rate (Hz)



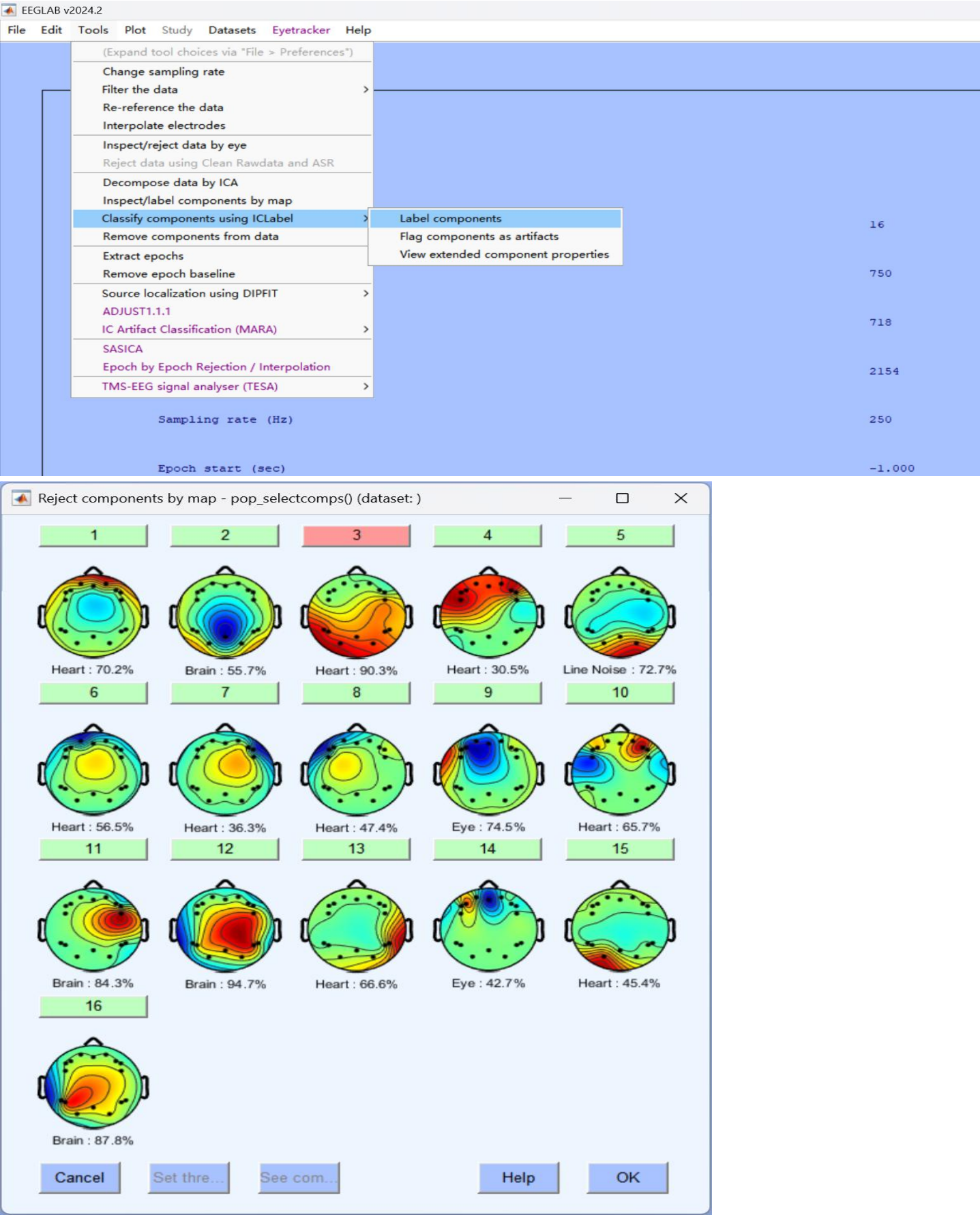
点击按钮，再点 ok，



然后点击数字可以查看详情

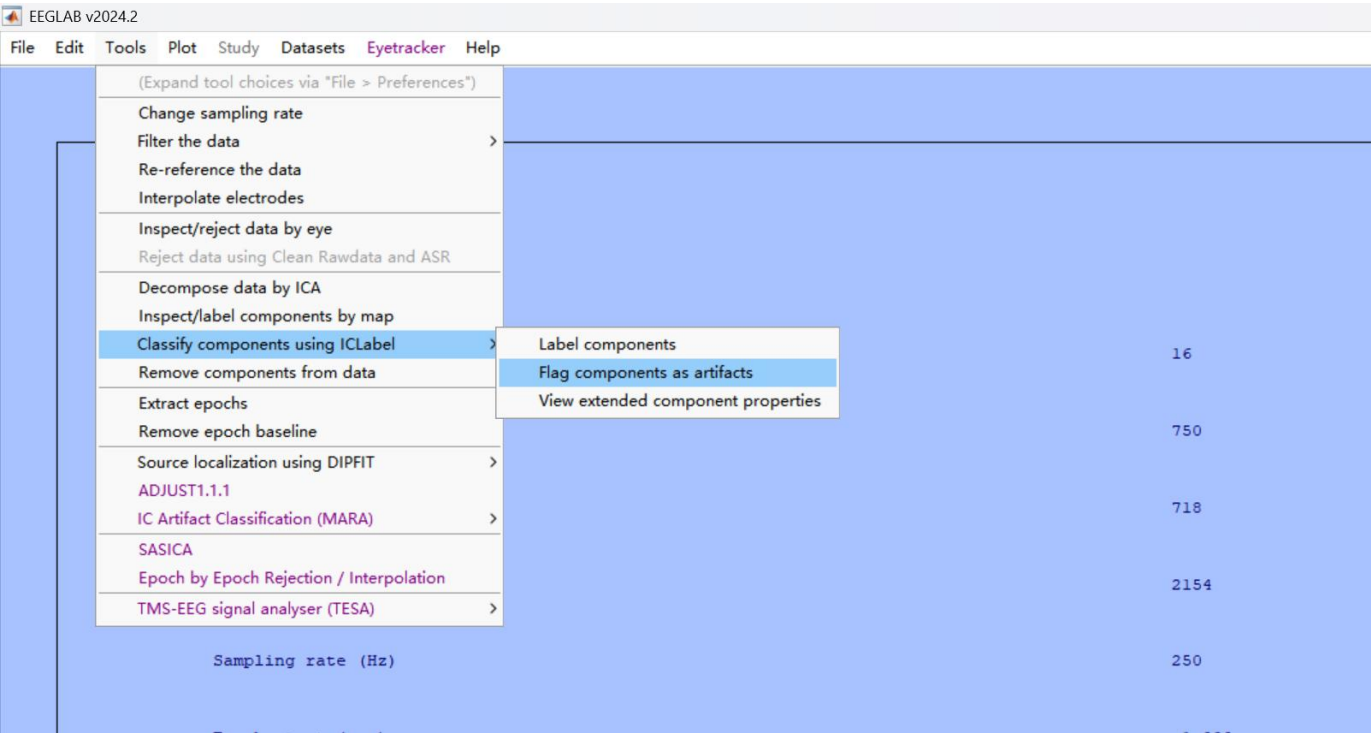


12.ICLabel 这个插件可以自动判断什么伪迹的概率 按照操作点击

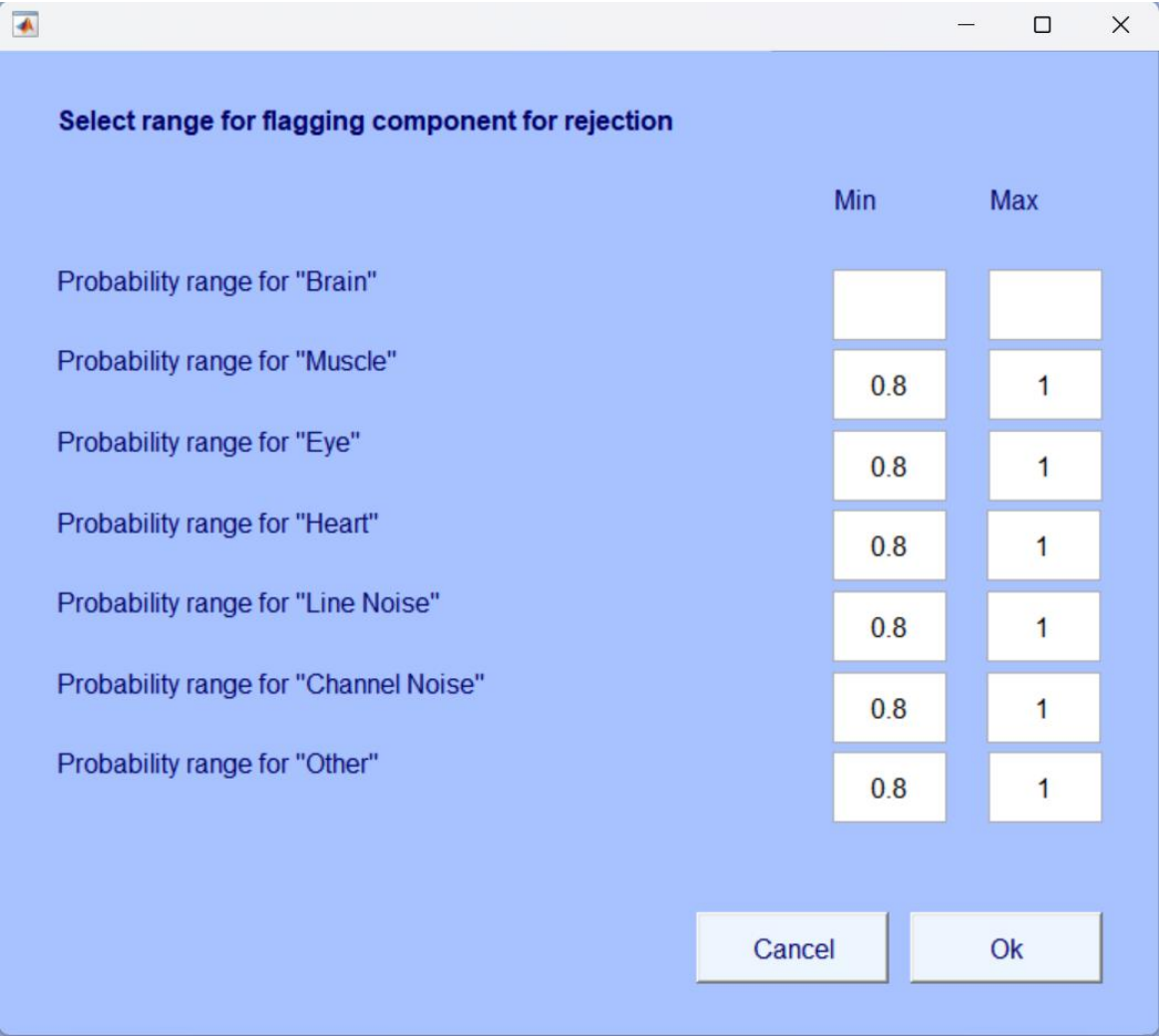


可以看到 3 的心电伪迹概率达到了 90.3%

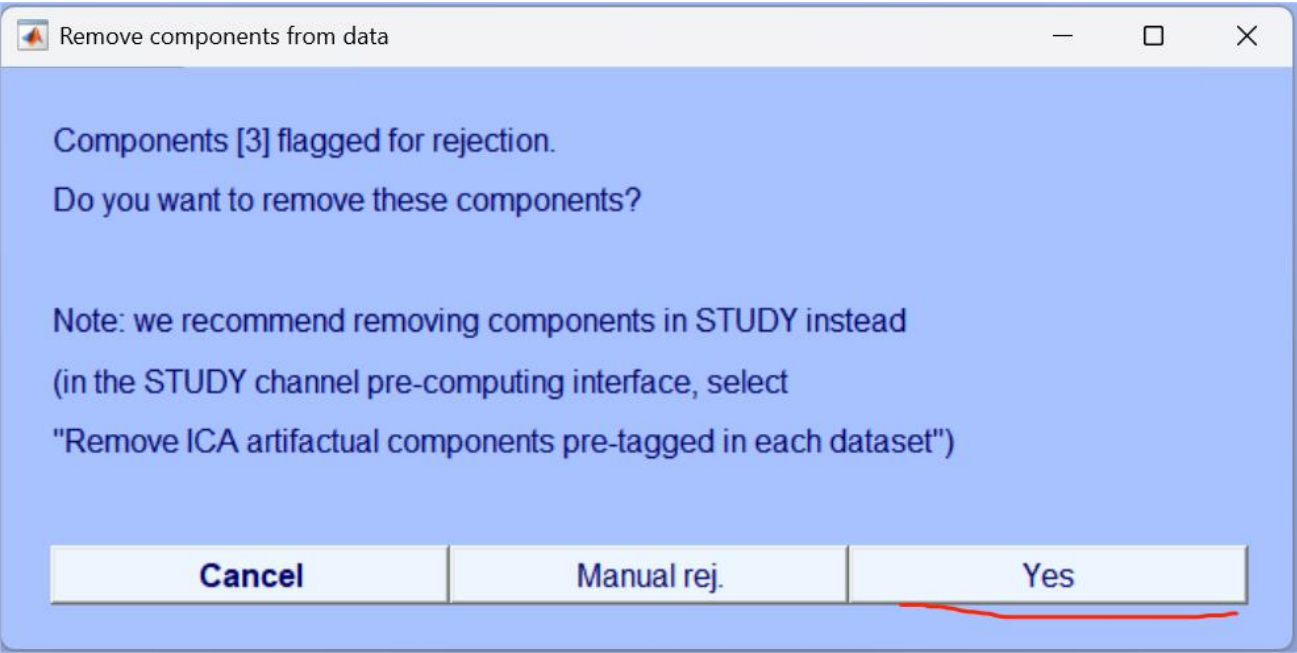
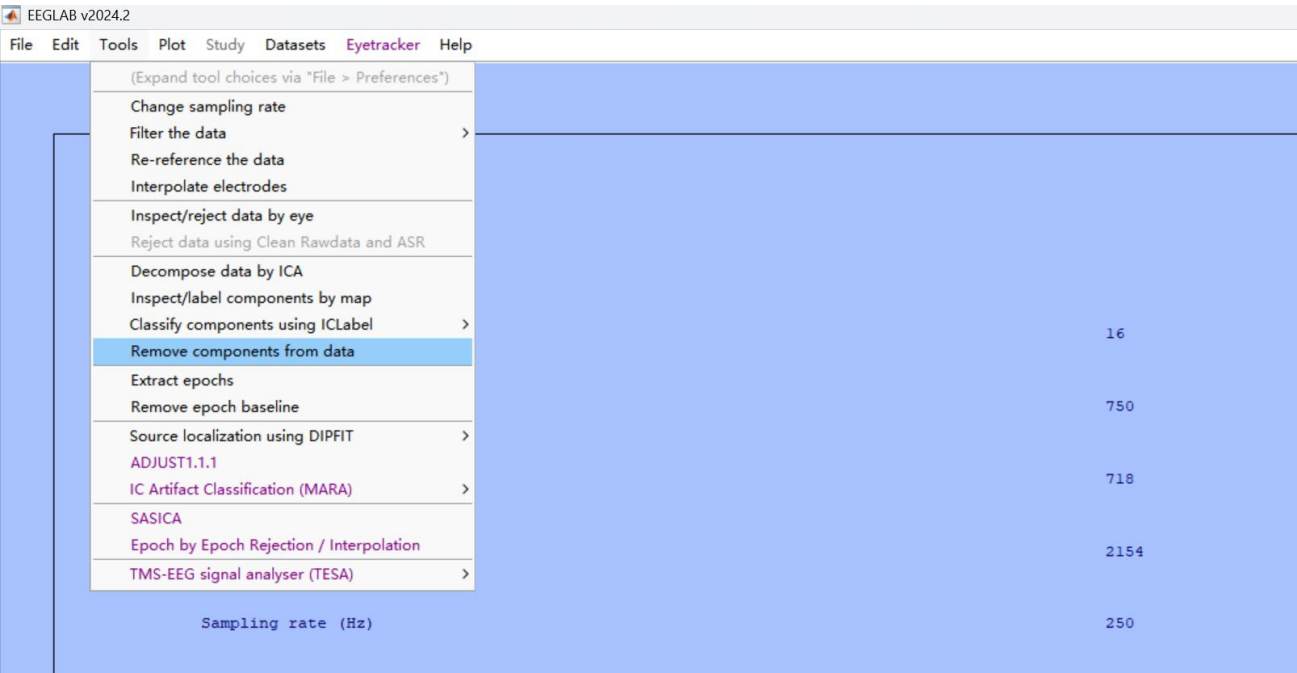
13.然后我们还可以使用 ICLabel 自动判断和标记 Ica 成分，点击如下操作



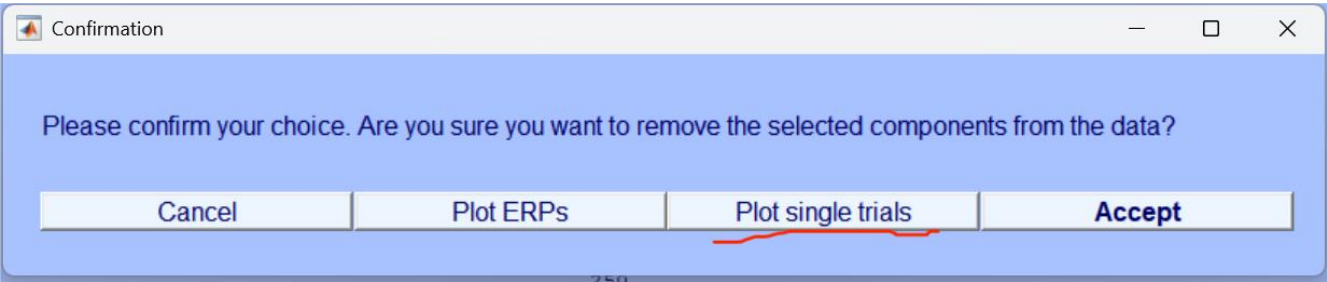
这里你可以设置一个阈值 默认的是 90%以上概率的伪迹标记，在之后去除，你也可以设置 70%，80%，都可以。

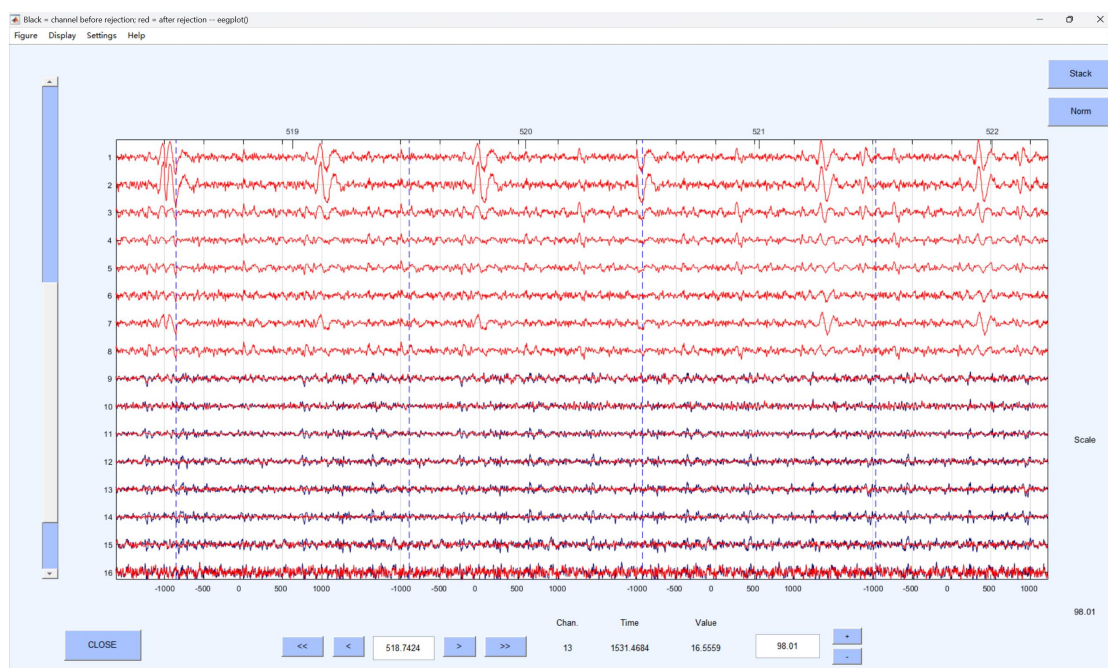


这时进行伪迹移除，之前的 3 号通道被标记，然后移除。



我们处理的是连续数据，所以点击 Plot single trials





然后把这个关闭，再点击 **Accept**，我们就成功去掉了 ICA 成分，我们这是还可以进行一次数据的筛选。

