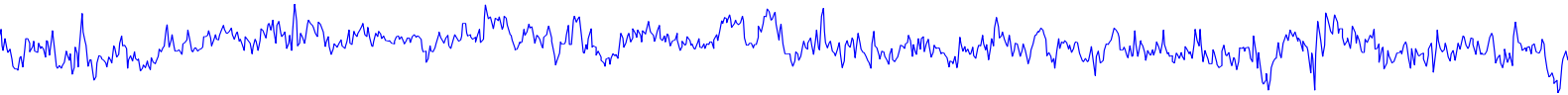
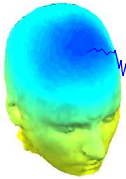
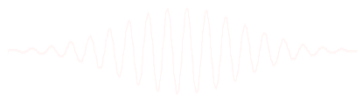


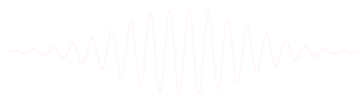
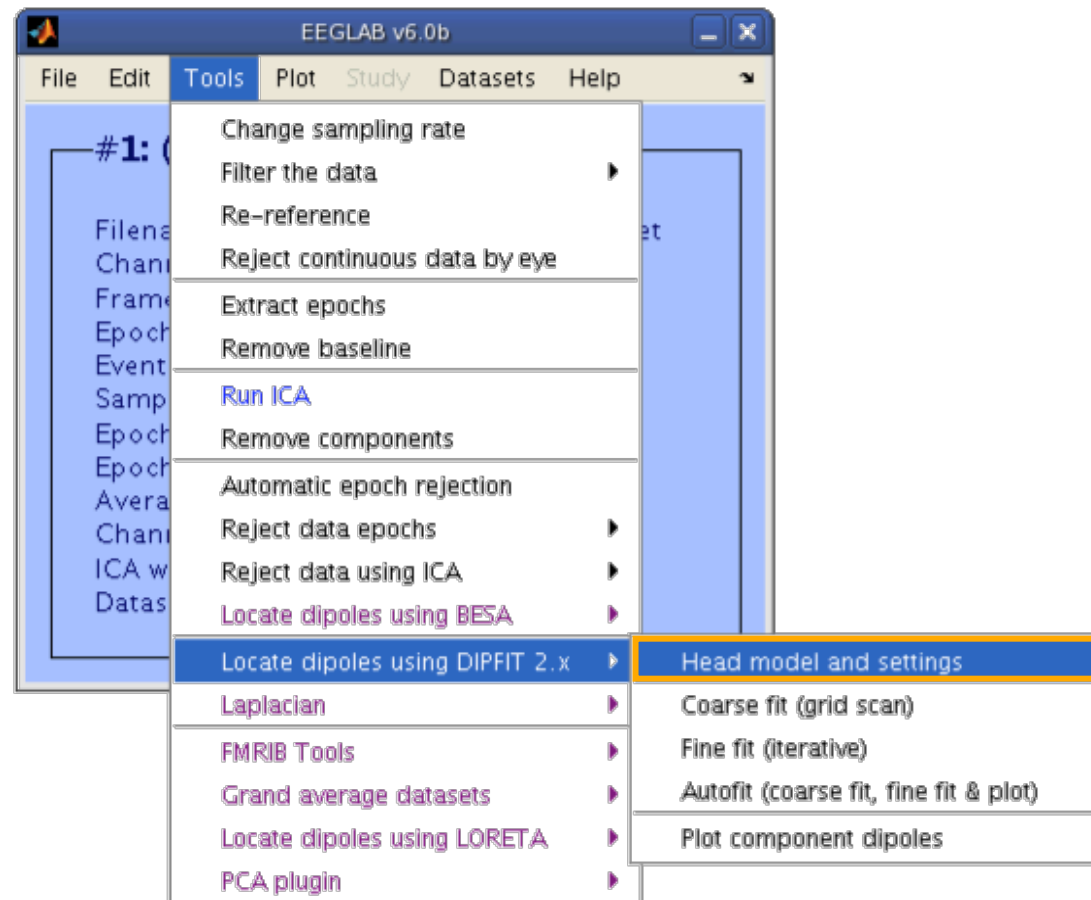
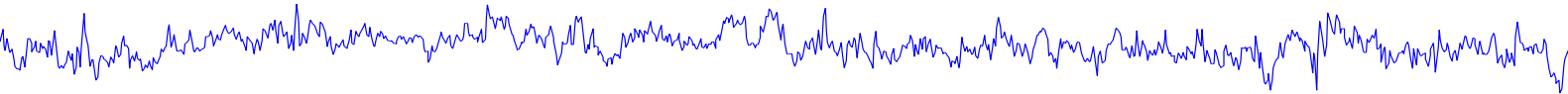
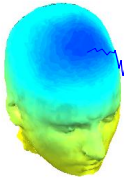
DIPFIT and model co-registration



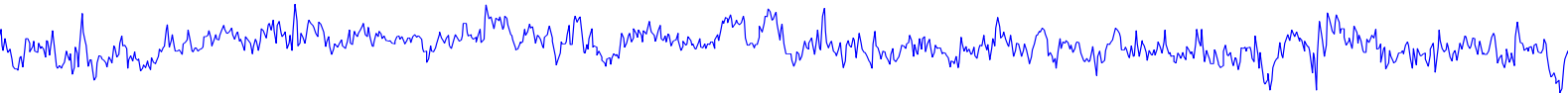
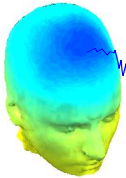
1. Co-register electrodes with model
2. Autofit, plot dipoles, fine fit
3. 3D headplot co-registration



Finding dipole locations using DIPFIT in EEGLAB



Co-register to model



Dipole fit settings - pop_dipfit_settings()

Head model (click to select): Spherical Four-Shell (BESA), Boundary Element Model (MNI), CTF MEG, Custom model files

Head model file: g:\lab\plugins\dipfit2.2\standard_BEM\standard_vol.mat

Output coordinates: MNI

MRI file: g:\lab\plugins\dipfit2.2\standard_BEM\standard_mri.mat

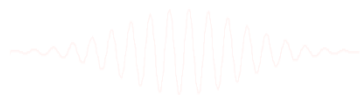
Model template channel locations file: g:\lab\plugins\dipfit2.2\standard_BEM\elec\standard_1005.elc

Co-register chan. locs. with head model: ☐ Manual Co-Reg. ☐ No Co-Reg.

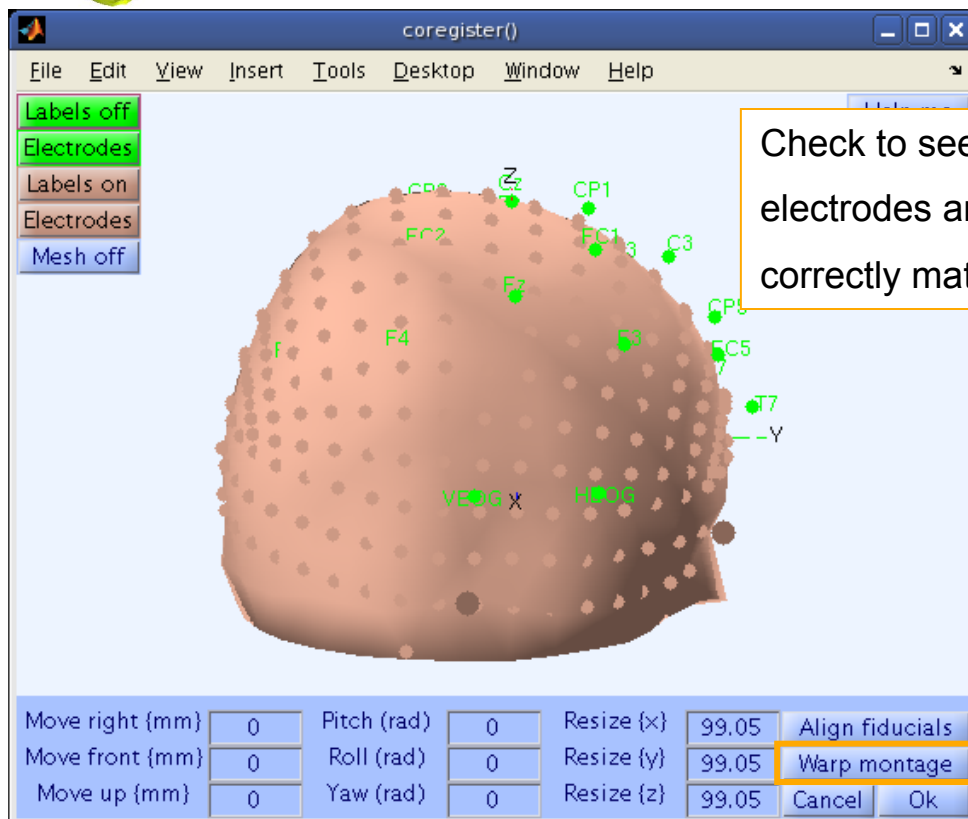
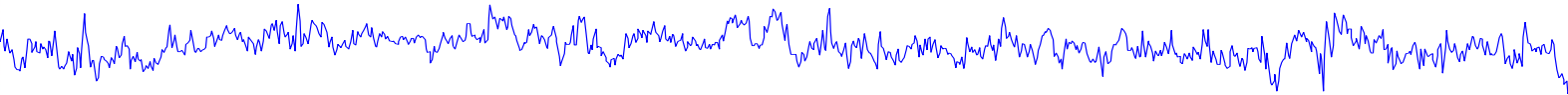
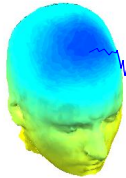
Channels to omit from dipole fitting:

Note: For EEG, check that the channel locations are on the surface of the head model
(To do this: 'Set head radius' to about 85 in the channel editor).

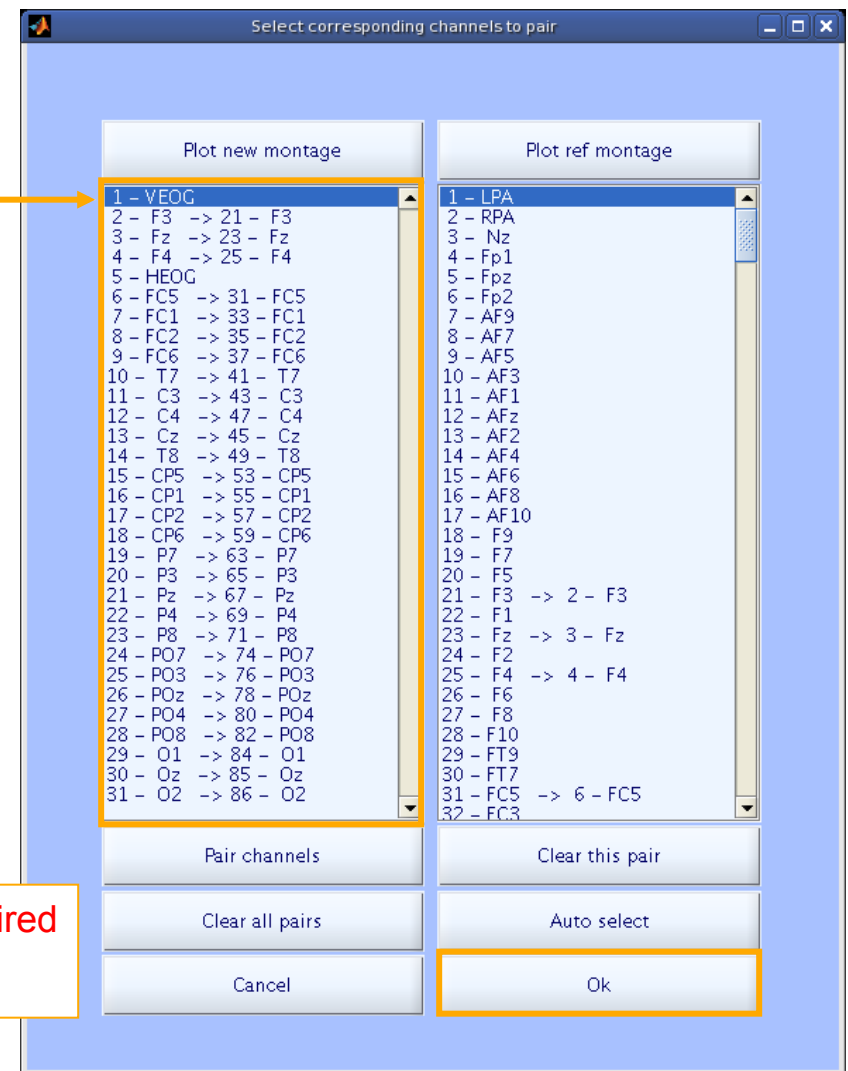
Buttons: Cancel, Help, Ok



Alternatively, warp to standard montage

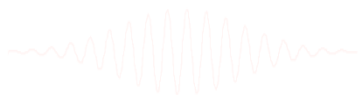
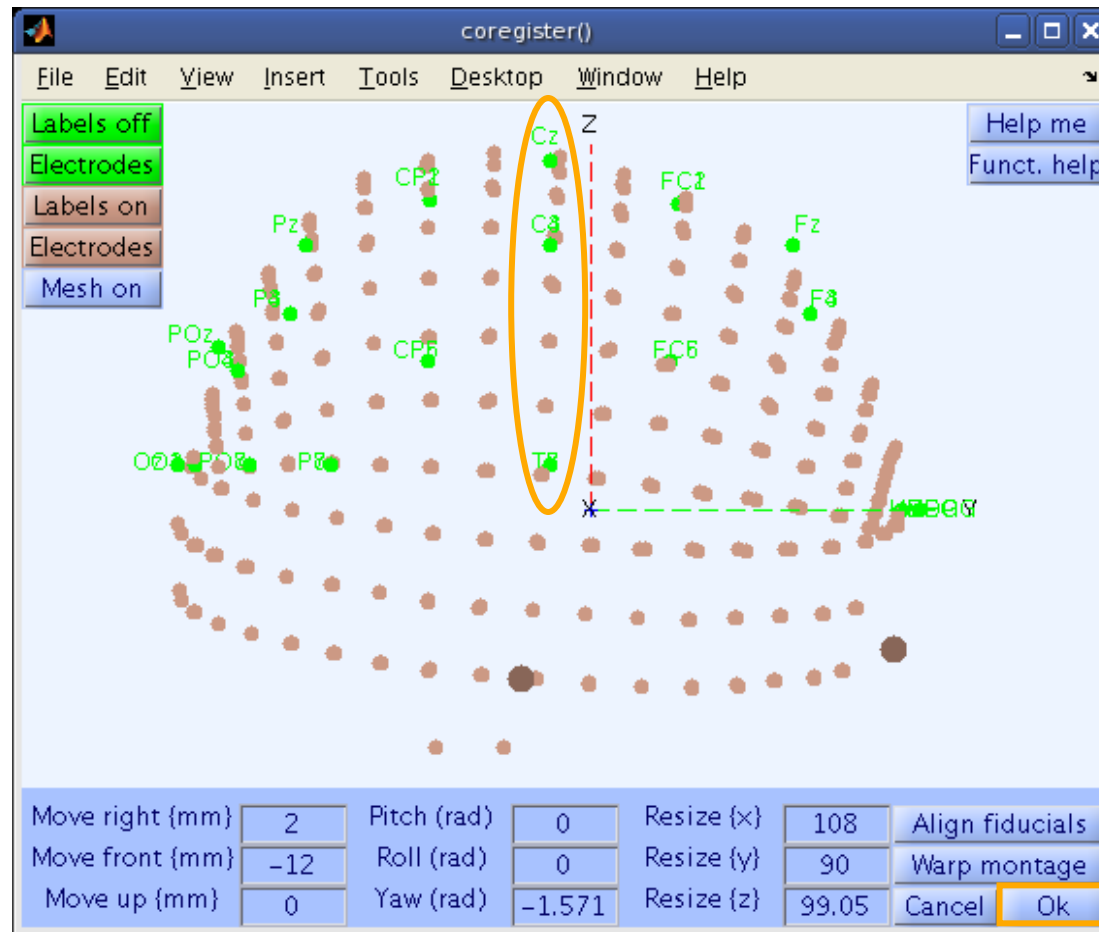
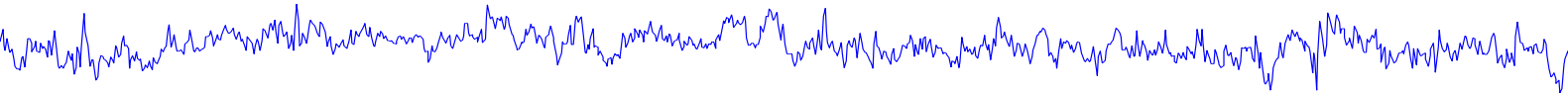
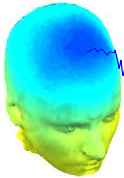


Check to see that electrodes are correctly matched

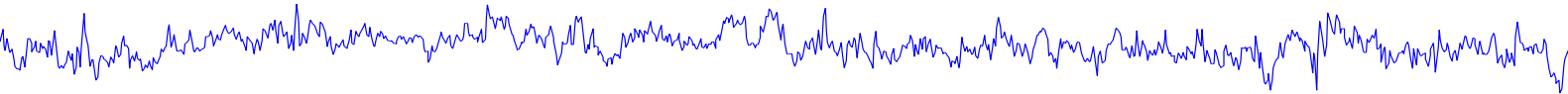
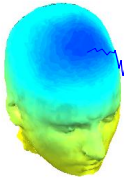


stats toolbox required for warping

Check coregistration with model



Confirm electrode transformation



Dipole fit settings - pop_dipfit_settings()

Head model (click to select)

Spherical Four-Shell (BESA)
Boundary Element Model (MNI)
CTF MEG
Custom model files

Head model file
Output coordinates
MRI file
Model template channel locations file
Co-register chan. locs. with head model
Channels to omit from dipole fitting

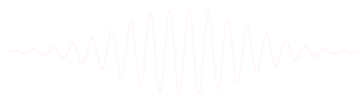
g:\lab\plugins\dipfit2.2\standard_BEM\standard_vol.mat
MNI
g:\lab\plugins\dipfit2.2\standard_BEM\standard_mri.mat
g:\lab\plugins\dipfit2.2\standard_BEM\elec\standard_1005.elc

0 -1.570796 108 90 99.05485

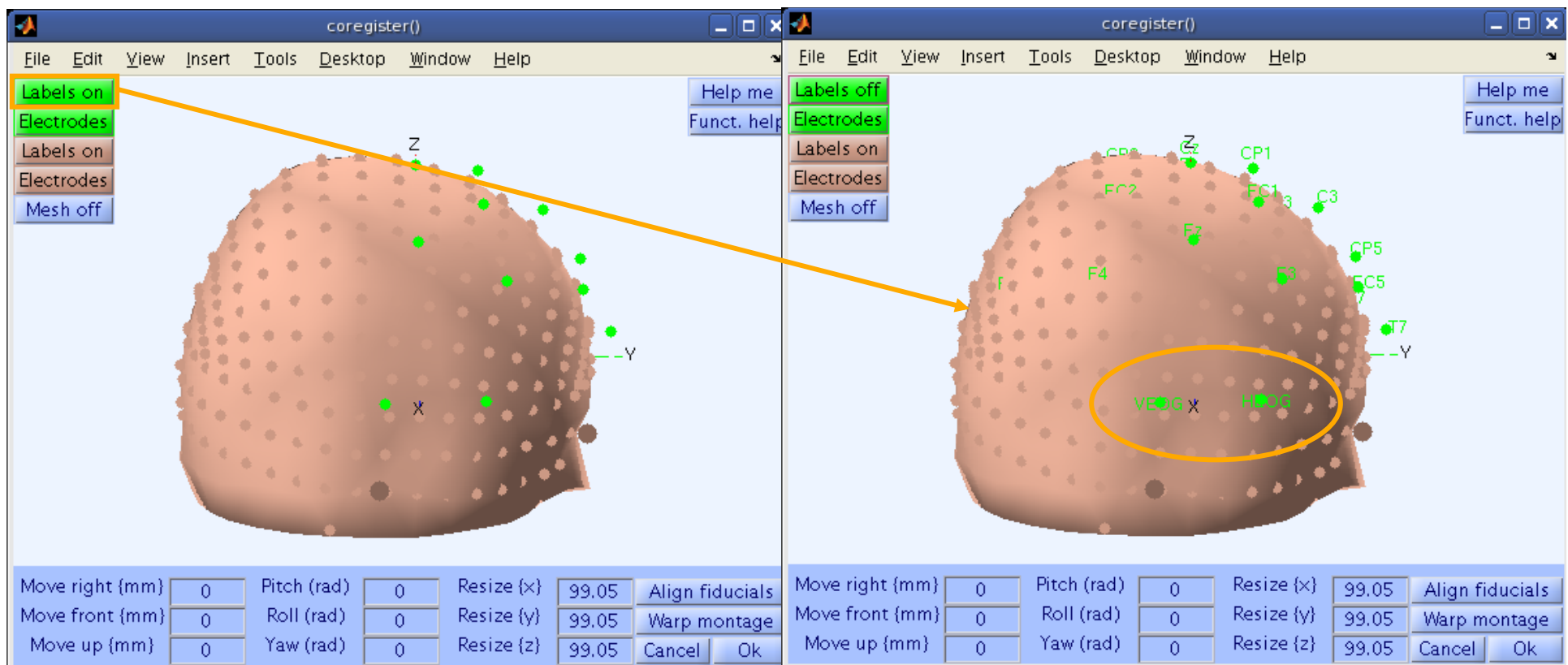
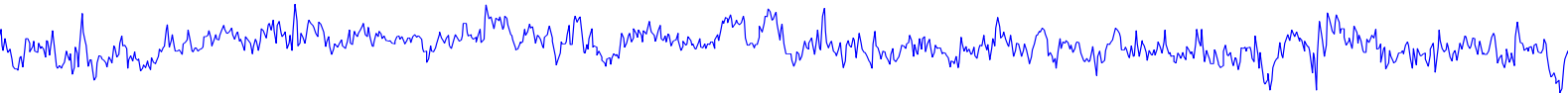
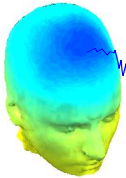
Browse Click to select
Browse Browse
Manual Co-Reg. ☐ No Co-Reg.
List

Note: For EEG, check that the channel locations are on the surface of the head model
(To do this: 'Set head radius' to about 85 in the channel editor).

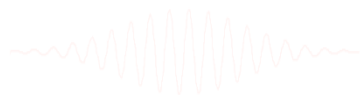
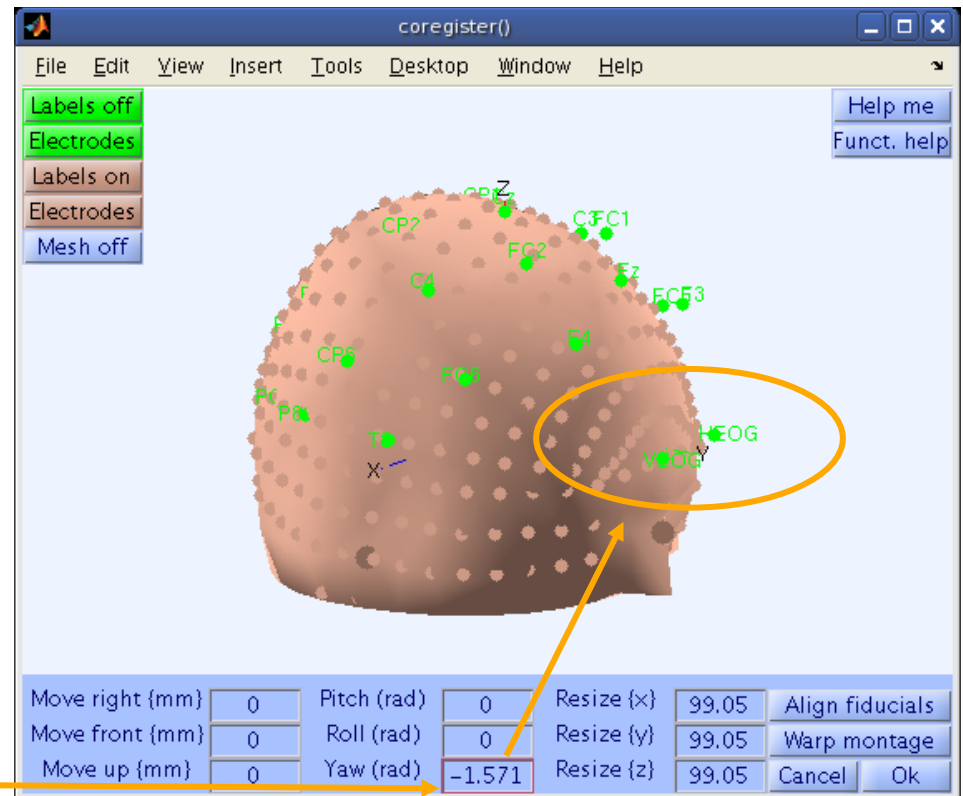
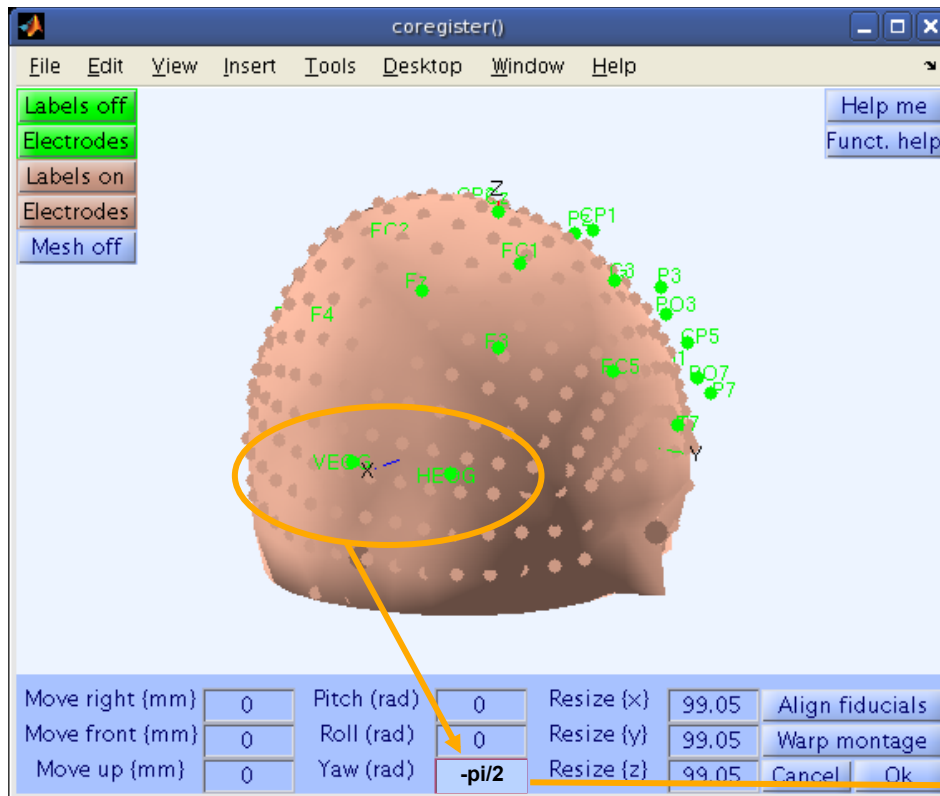
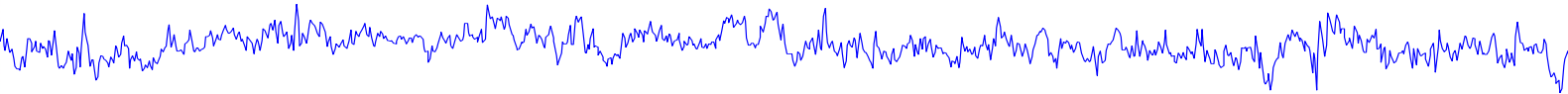
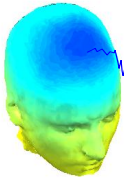
Cancel Help Ok



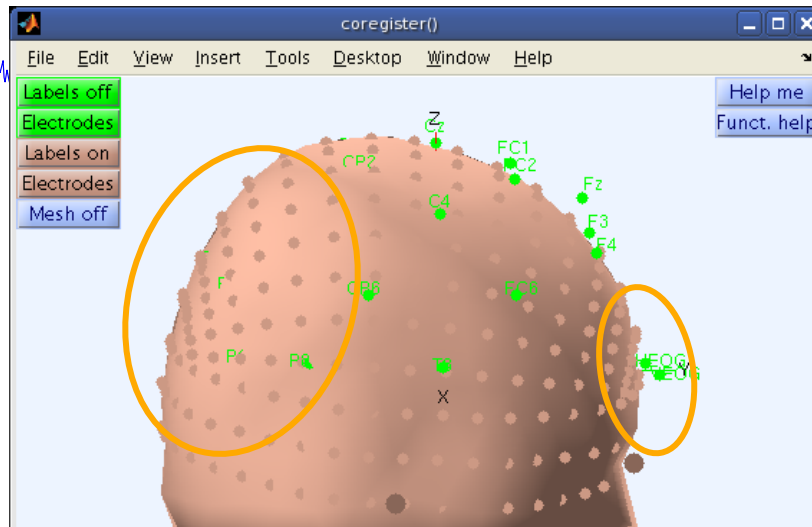
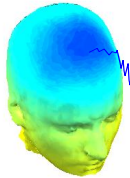
Co-register to model, cont'd



Perform translation of electrode positions



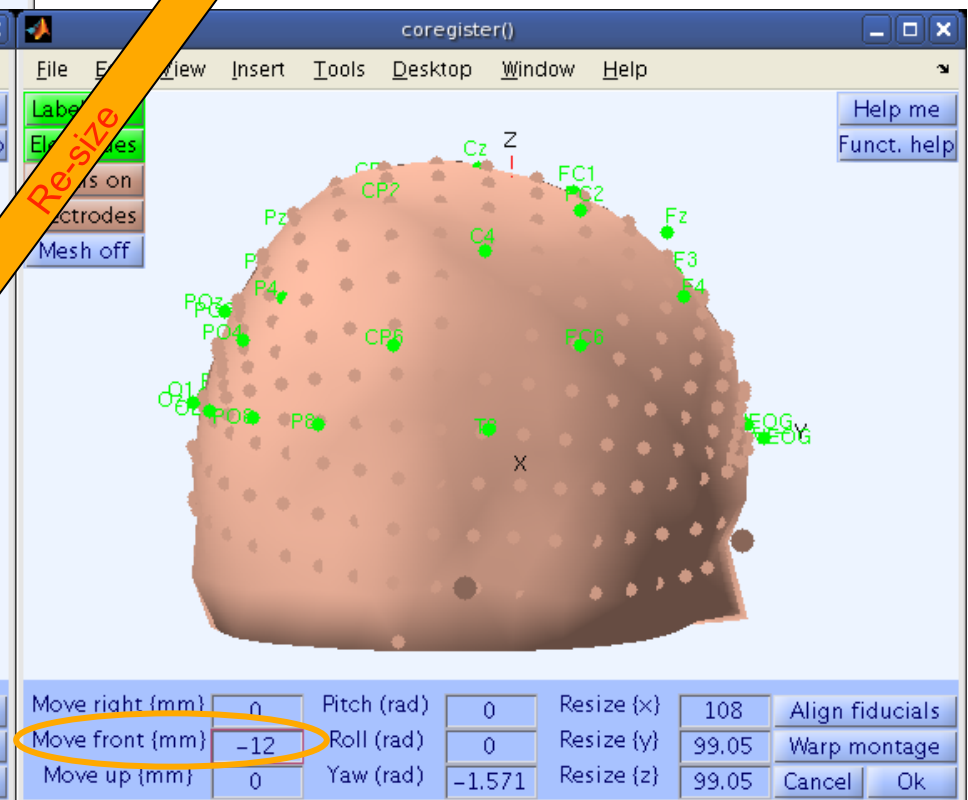
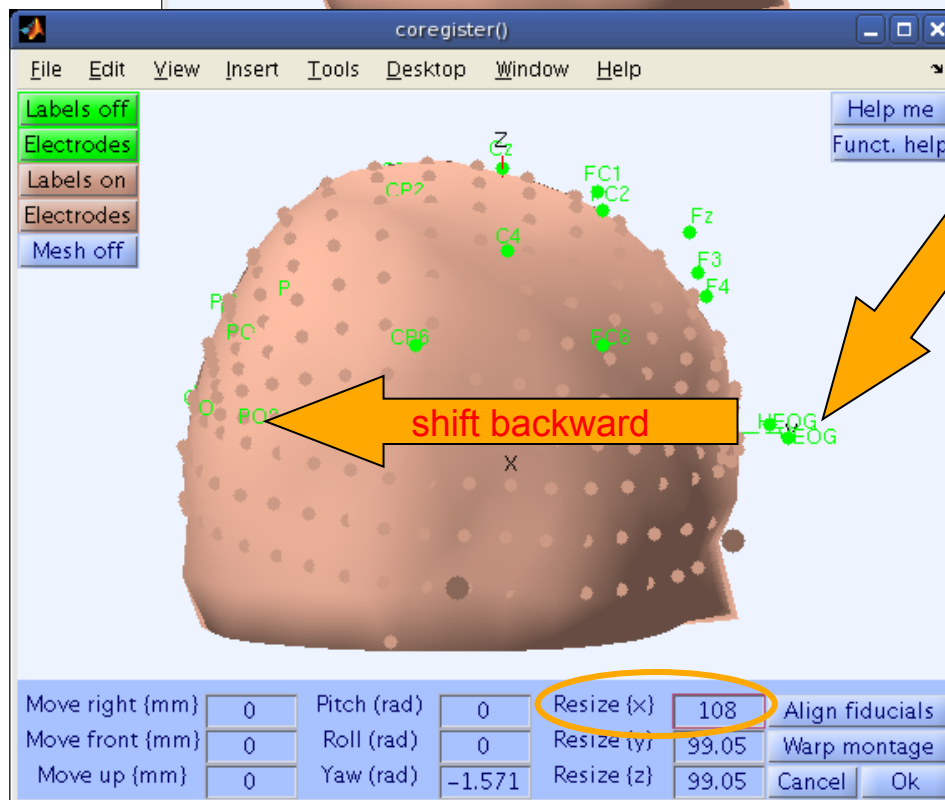
Perform translation of electrode positions



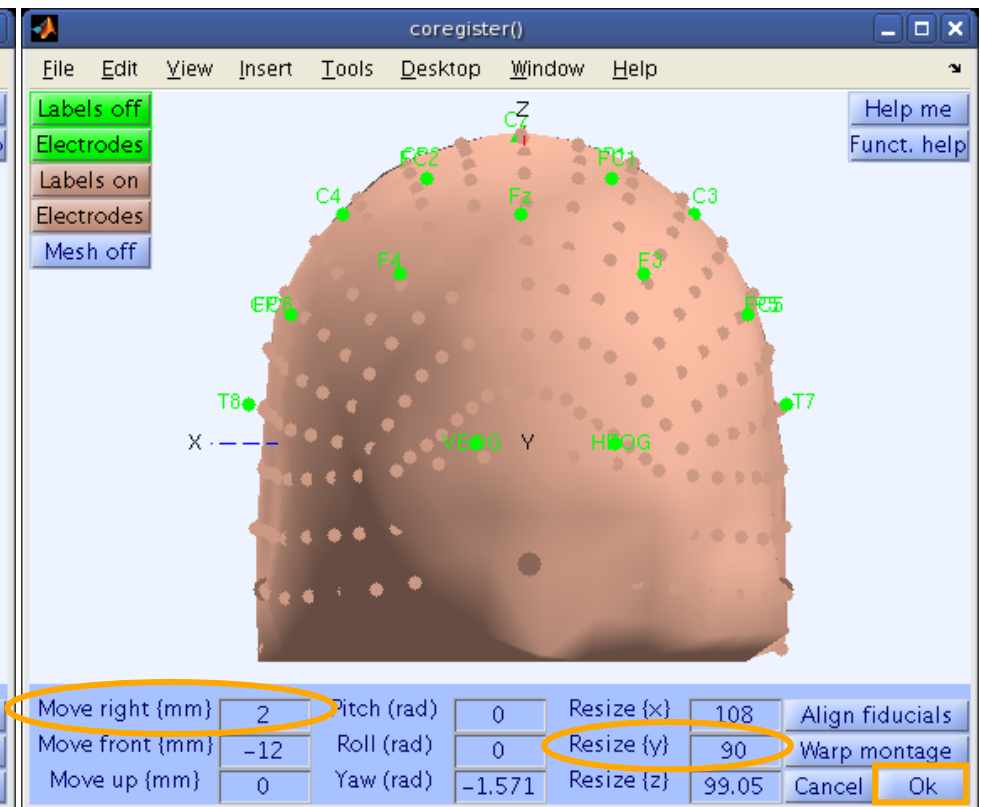
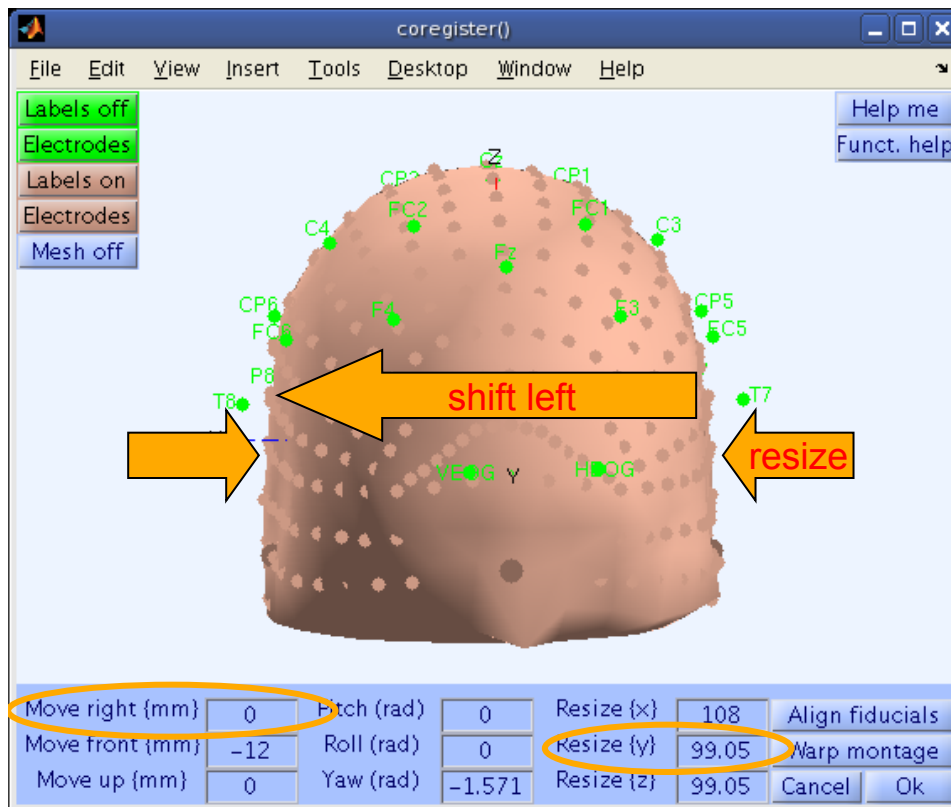
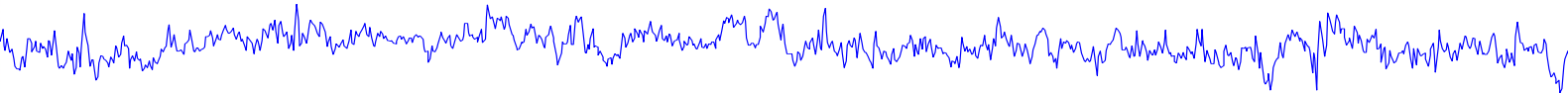
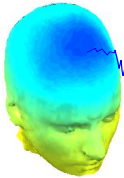
Requires a shift toward back of the head

AND

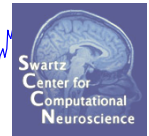
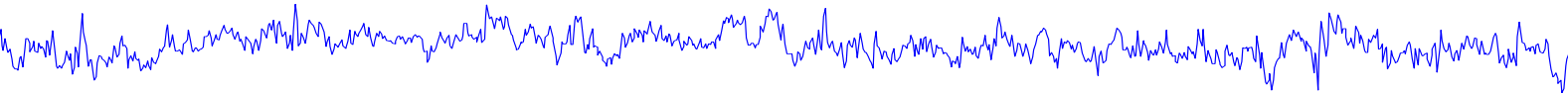
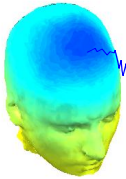
an expansion along the X-axis



Perform translation of electrode positions



EEG.dipfit structure



```
>> EEG.dipfit
```

```
ans =
```

```
hdmfile: [1x76 char]
```

```
mrifile: [1x71 char]
```

```
chanfile: [1x83 char]
```

```
chansel: [1x33 double]
```

```
coordformat: 'spherical'
```

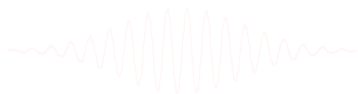
```
model: [1x33 struct]
```

```
current: 32
```

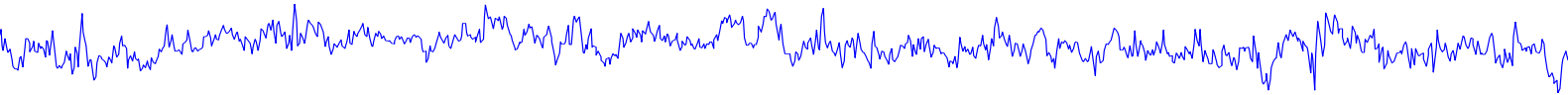
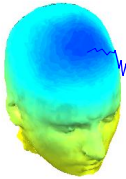
```
vol: [1x1 struct]
```

```
coord_transform: [0 0 -1.570796 100 76 90.87264 1 1 1]
```

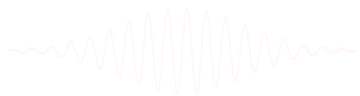
From head model transformations



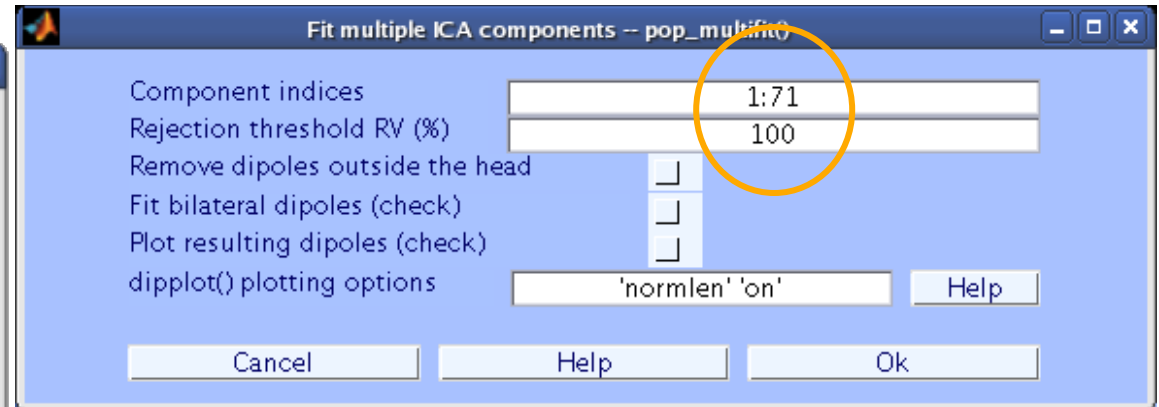
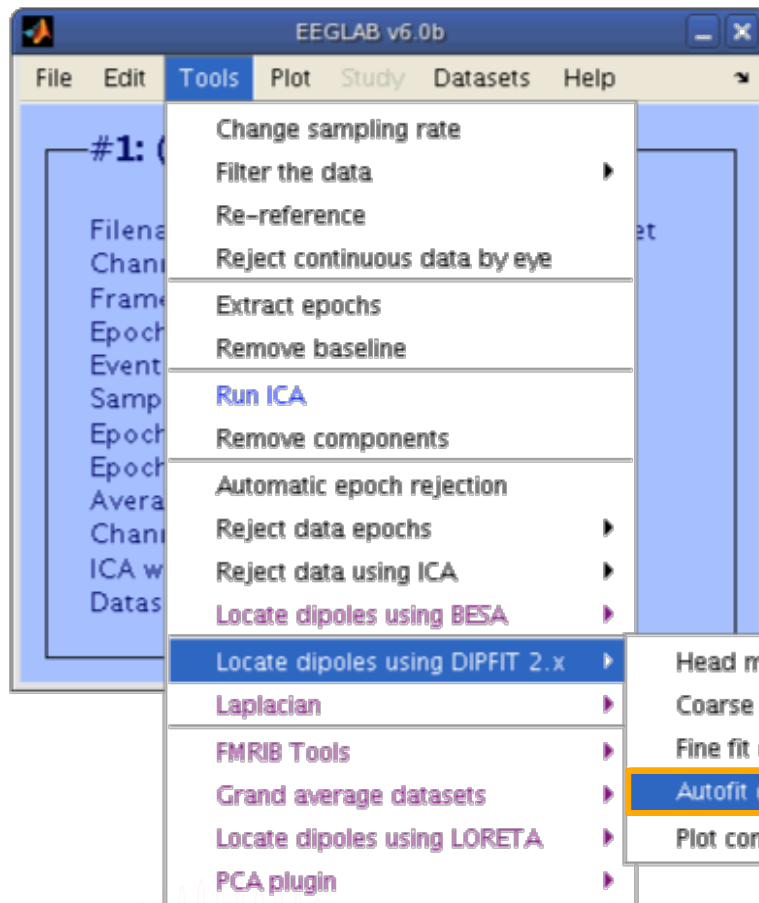
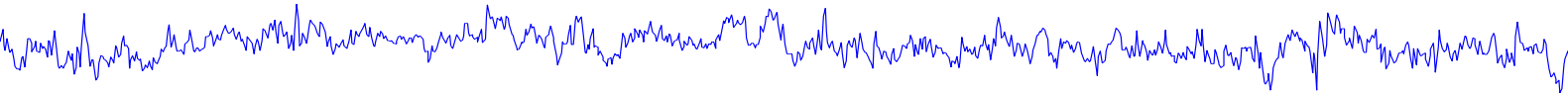
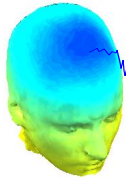
DIPFIT and model co-registration



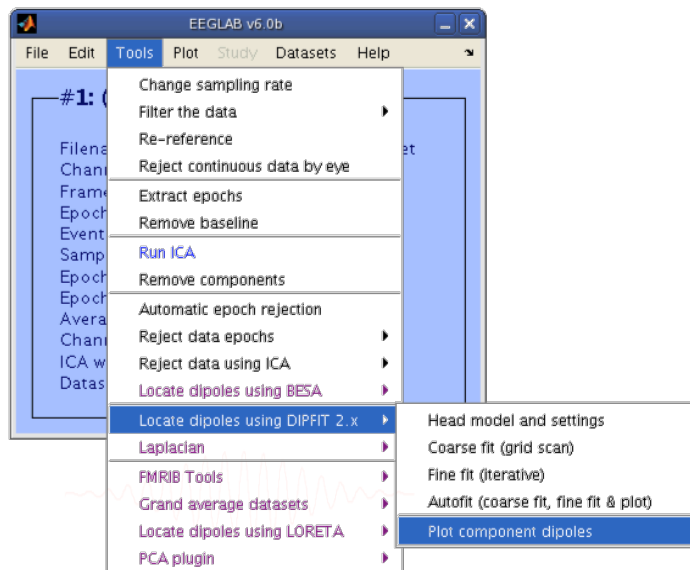
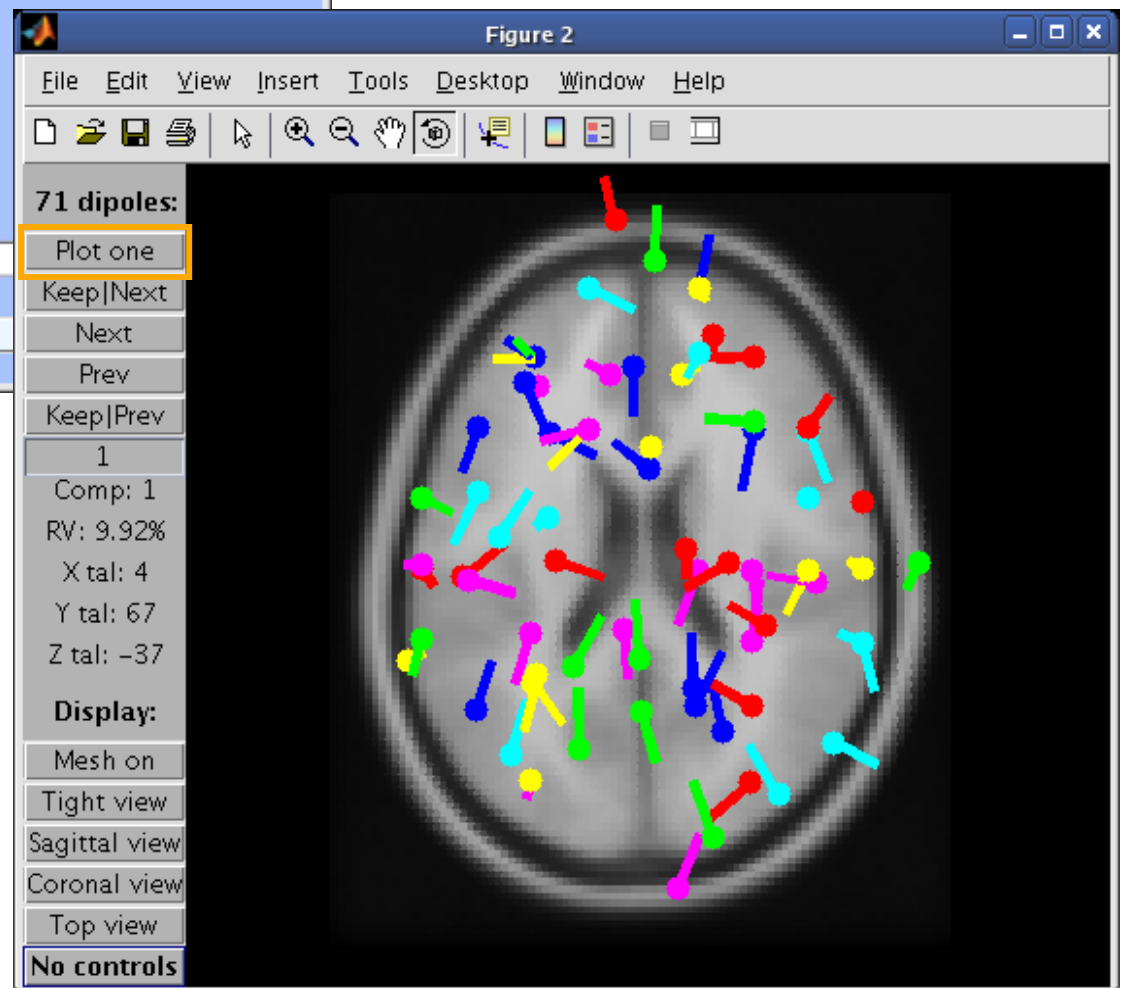
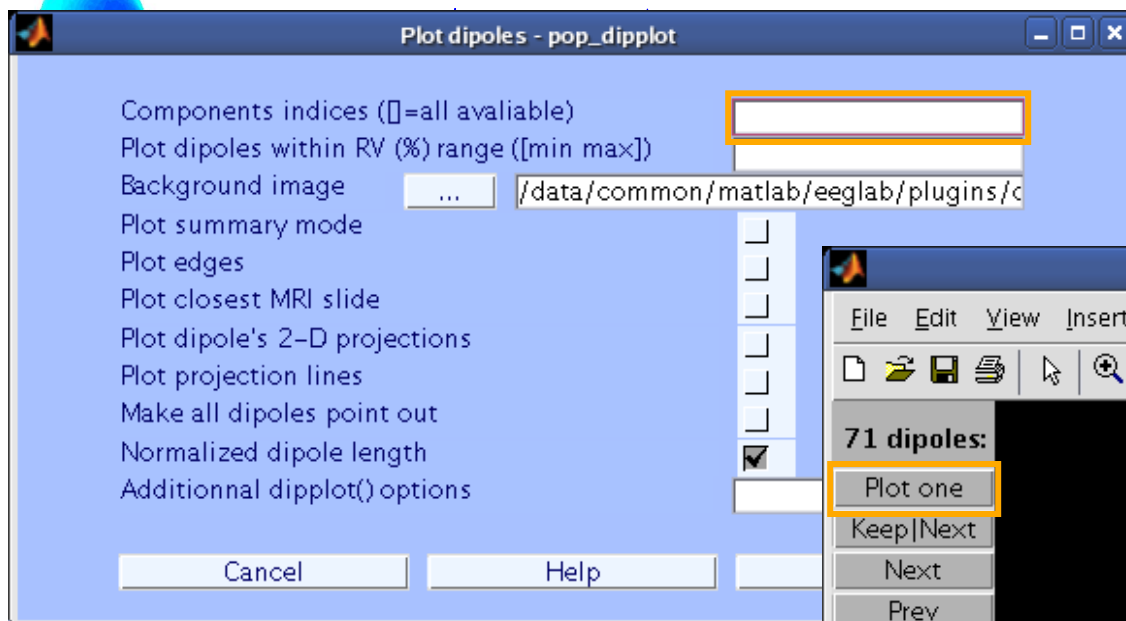
1. Co-register electrodes with model
2. Autofit, plot dipoles, fine fit
3. 3D headplot co-registration



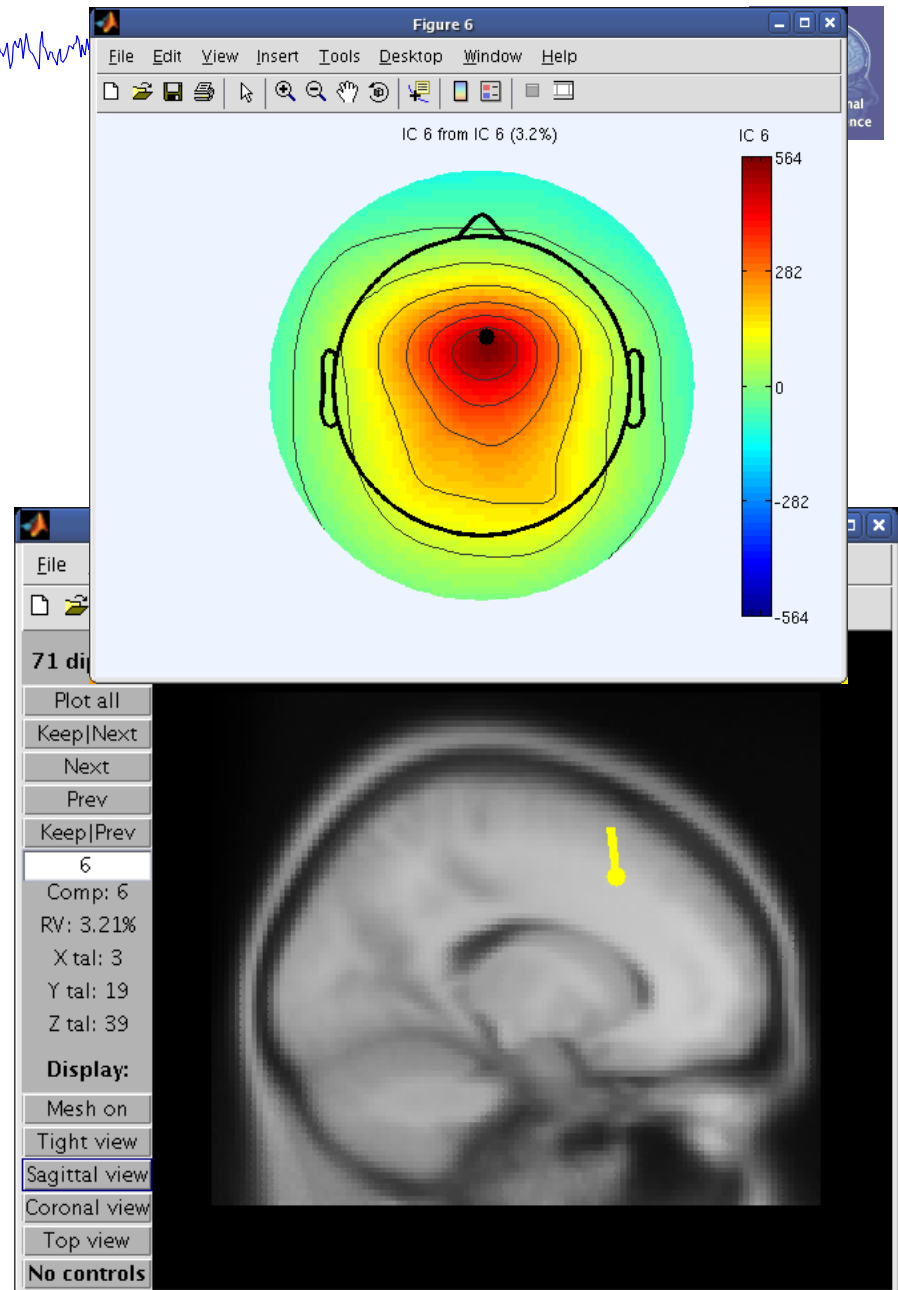
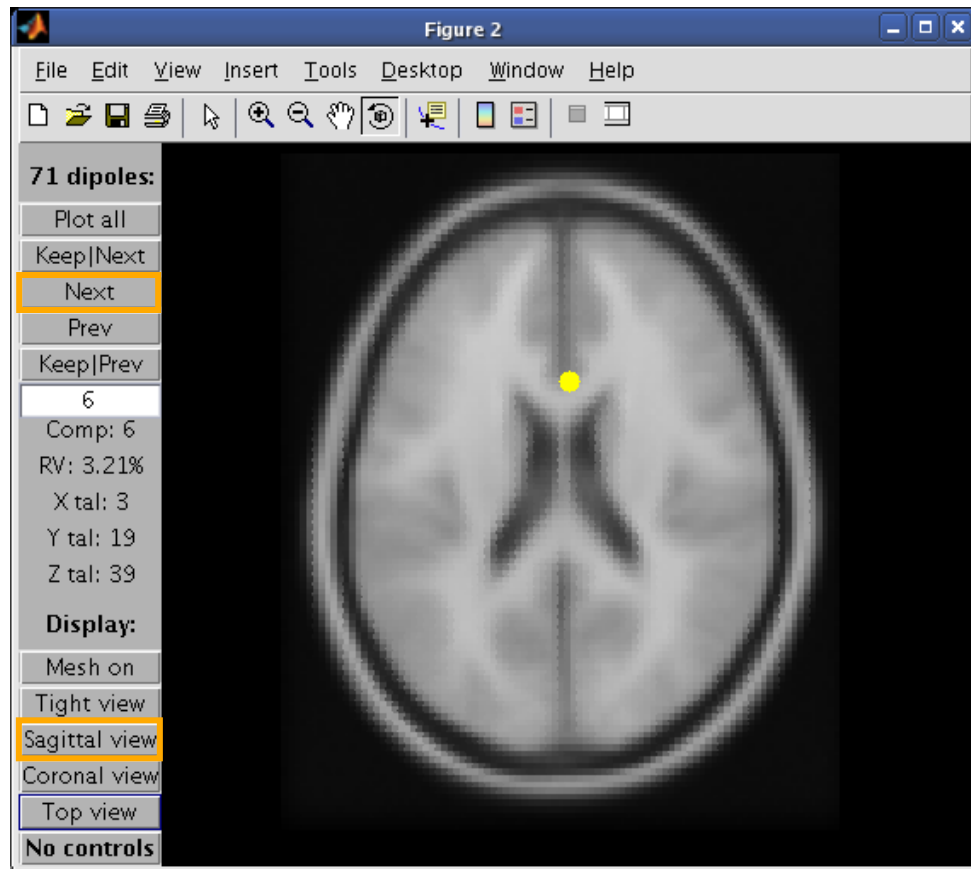
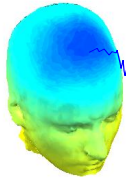
Autofit equivalent dipoles



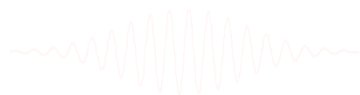
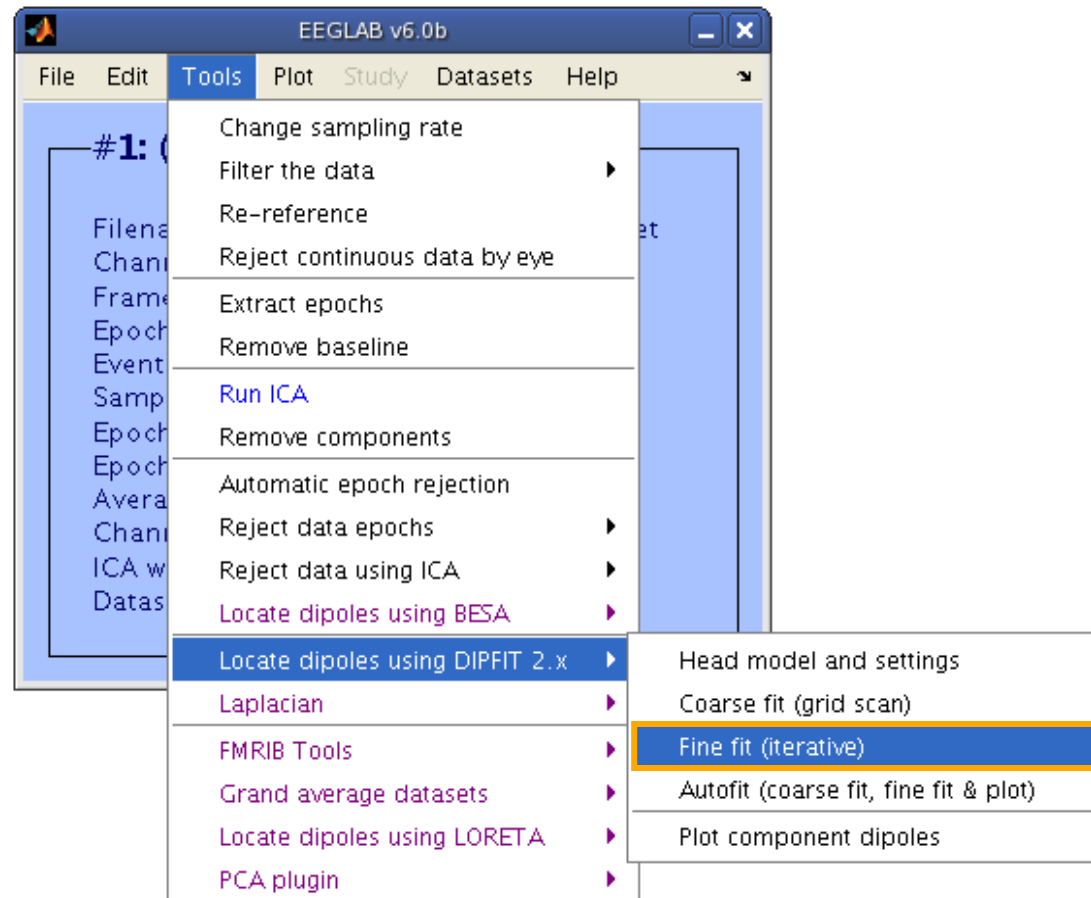
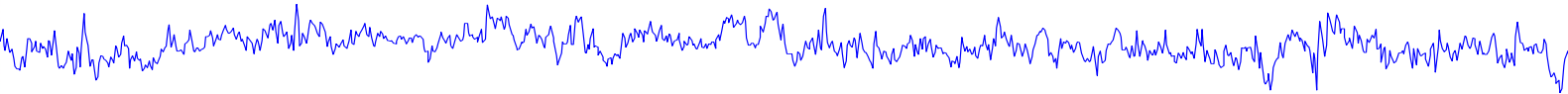
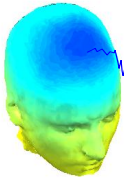
Plot dipoles



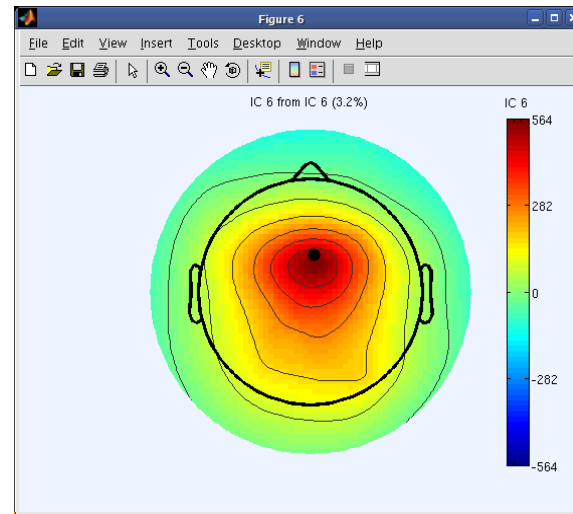
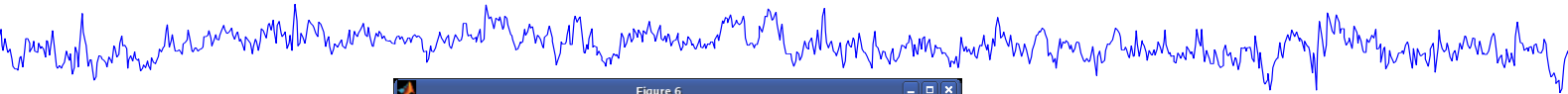
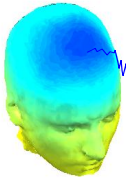
Scroll through dipoles



Fine fit options in DIPFIT



Fine fit menu



Manual dipole fit -- pop_dipfit_nonlinear()

Component to fit: 6 Plot map Residual variance = 3.21%

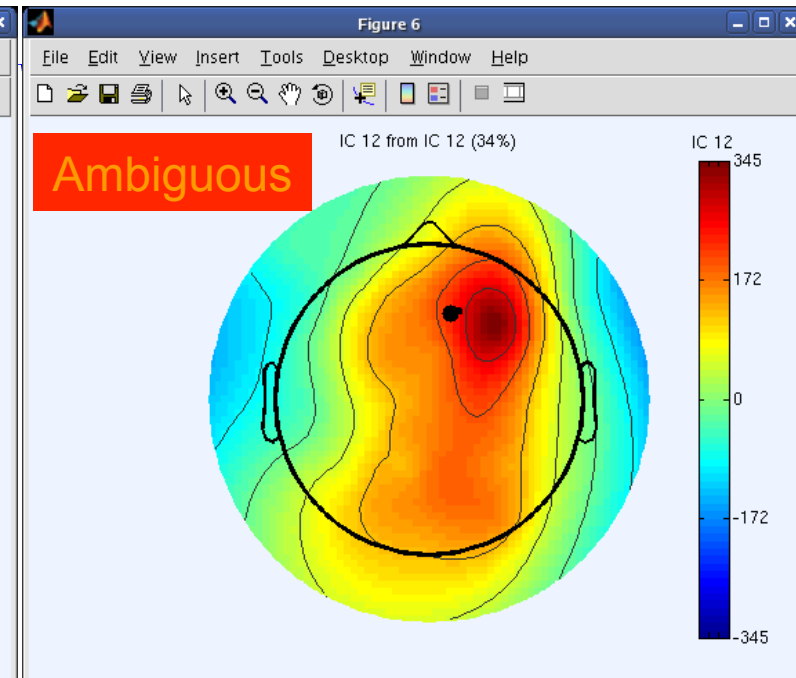
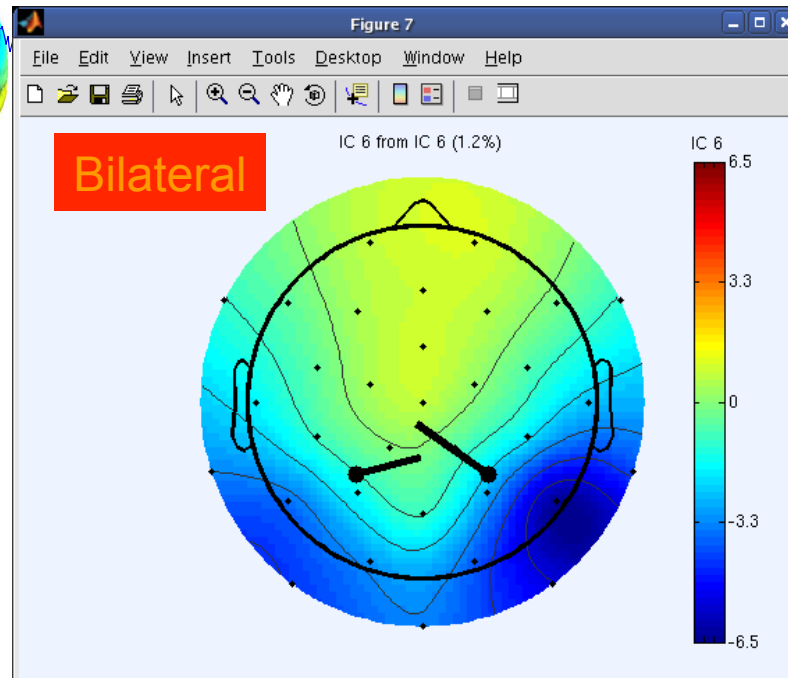
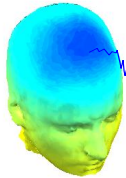
dipole	fit	position	moment	
#1	<input checked="" type="checkbox"/>	28.222 -2.401 37.331	2.380 475942.653 3819304.288	Flip (in out)
#2	<input type="checkbox"/>	0.000 0.000 0.000	0.000 0.000 0.000	Flip (in out)

☒ Symmetry constrain for dipole ...

Fit dipole(s)' position & moment Or fit only dipole(s)' moment Plot dipole(s)

Cancel Help Ok

Bilateral dipoles



Manual dipole fit -- pop_dipfit_nonlinear()

Component to fit: 6 Plot map Residual variance = 1.23%

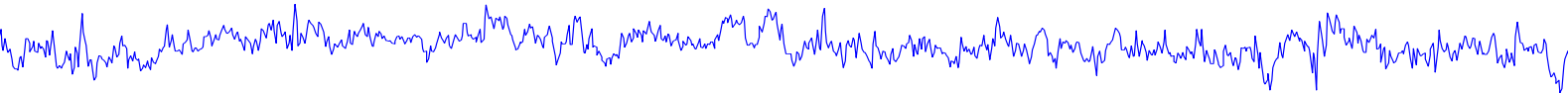
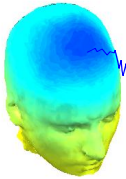
dipole	fit	position	moment	
#1	<input checked="" type="checkbox"/>	-35.066 -32.492 -4.684	32271.382 46141.284 5880.224	Flip (in out)
#2	<input checked="" type="checkbox"/>	-35.066 32.492 -4.684	1005.419 -38050.427 14094.824	Flip (in out)

☒ Symmetry constrain for dipole ...

Fit dipole(s)' position & moment Or fit only dipole(s)' moment Plot dipole(s)

Cancel Help Ok

EEG.dipfit structure



```
>> EEG.dipfit.model  
ans =
```

```
1x33 struct array with fields:
```

```
    posxyz
```

```
    momxyz
```

```
    rv
```

```
    active
```

```
    select
```

```
>> EEG.dipfit.model(1)
```

```
ans =
```

```
    posxyz: [1x3 double]
```

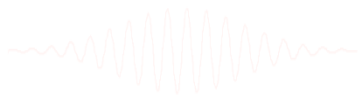
```
    momxyz: [1x3 double]
```

```
        rv: 0.0288
```

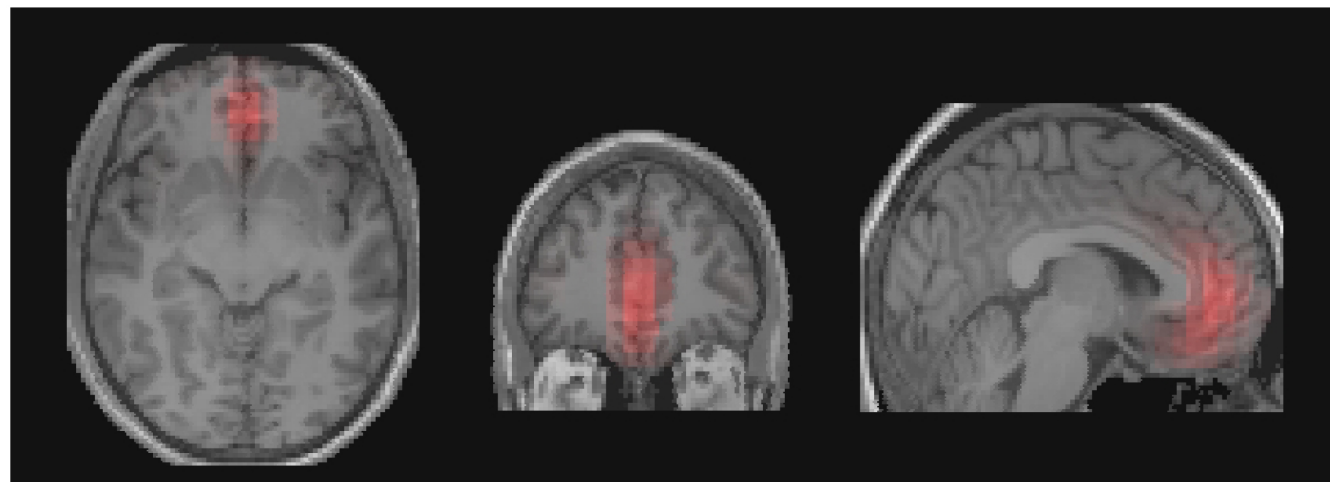
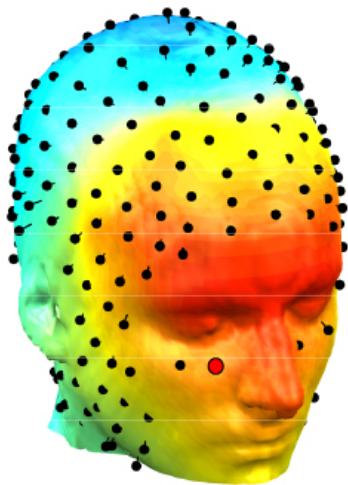
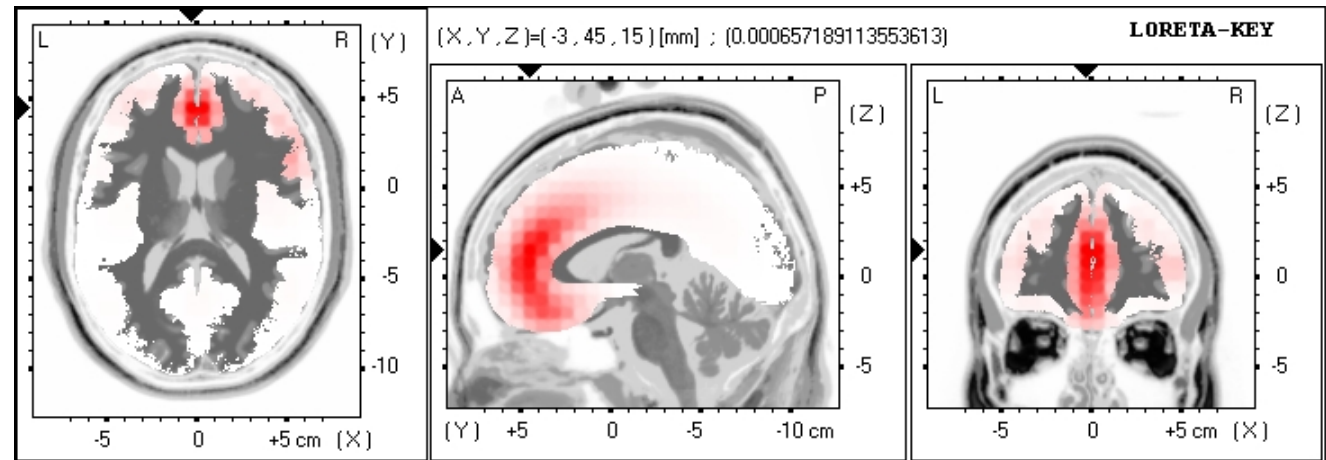
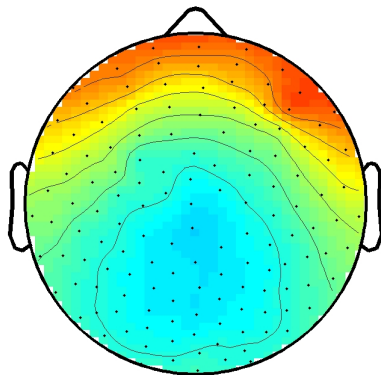
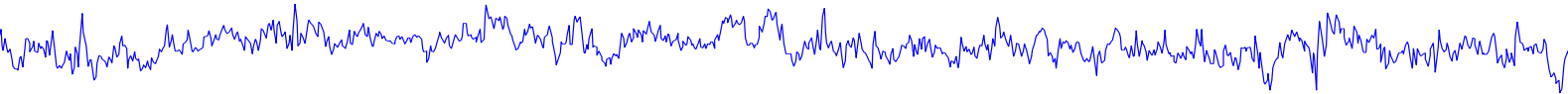
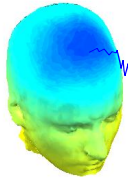
```
    active: 1
```

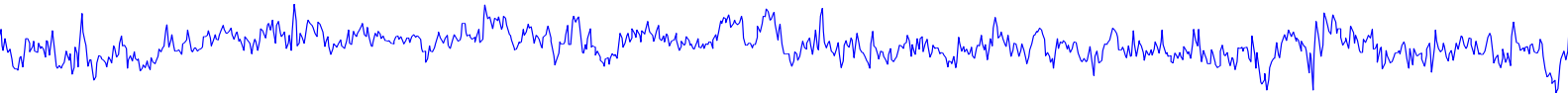
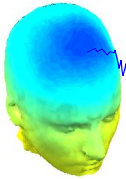
```
    select: 1
```

X	Y	Z
[14.9791	-86.0094	47.9448]



Localization of activity using Loreta





https://sccn.ucsd.edu/wiki/LORETA_for_EEGLAB

(8) LORETA plugin for EEGLAB x Person 1

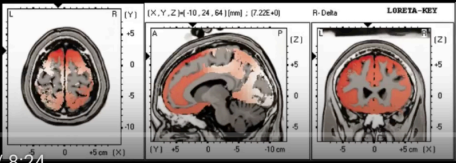
Secure | https://www.youtube.com/watch?v=amtvN_Sb6A

Apps Qwant Google Google maps Sofia email MyYoutb Math Leili JAST Japan Israel Activit Jira PJ mask Other Bookmarks

YouTube^{JP} Rechercher

Using the LORETA 2.0 plugin for EEGLAB

Arnaud Delorme, PhD



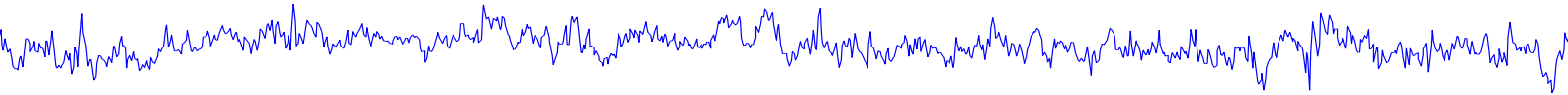
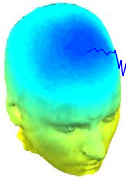
0:01 / 8:24

LORETA plugin for EEGLAB

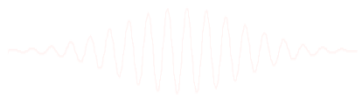
293 vues

5 0 PARTAGER

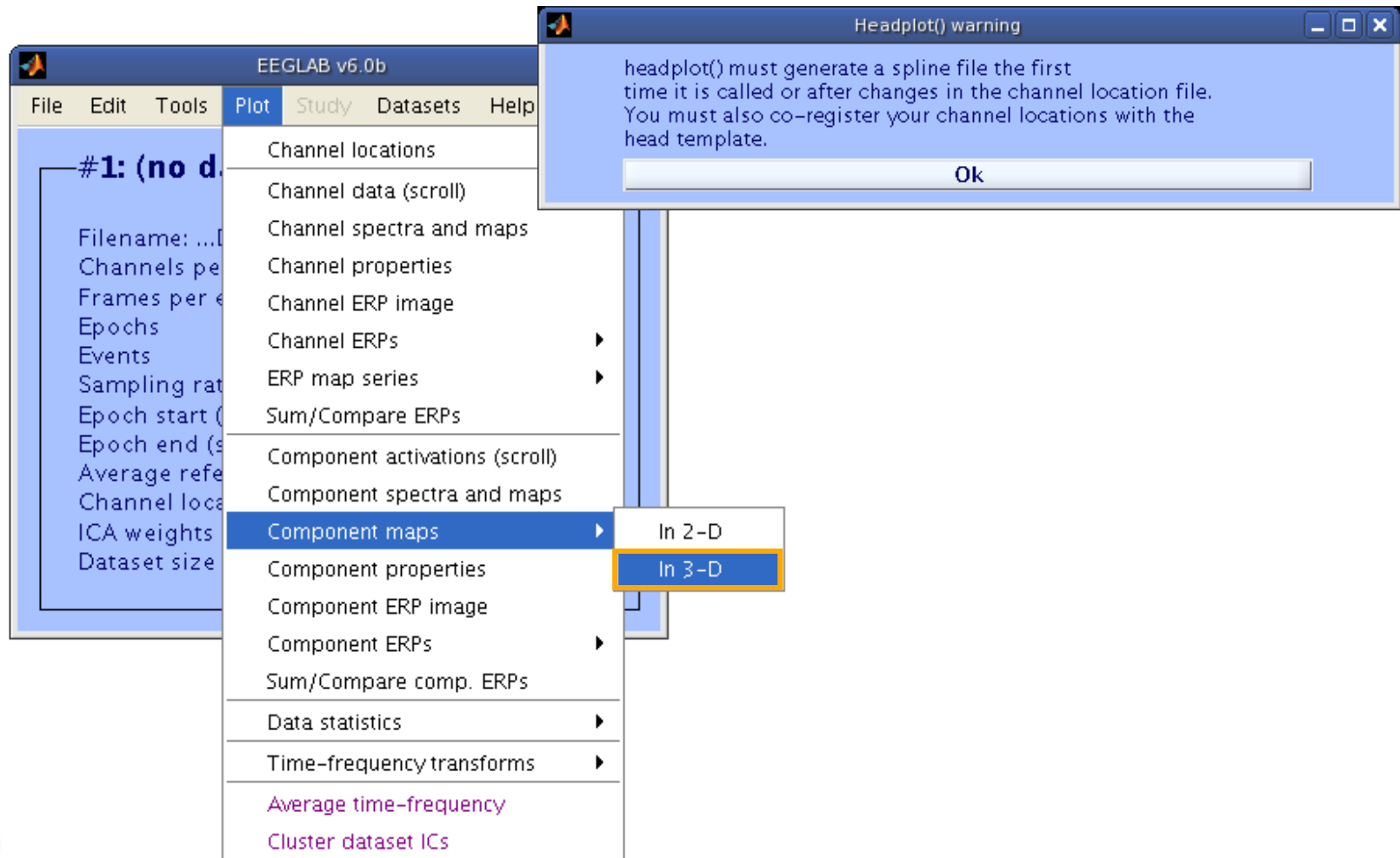
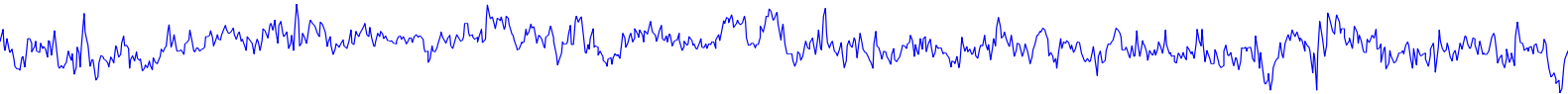
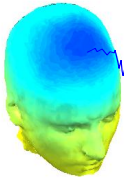
DIPFIT and model co-registration



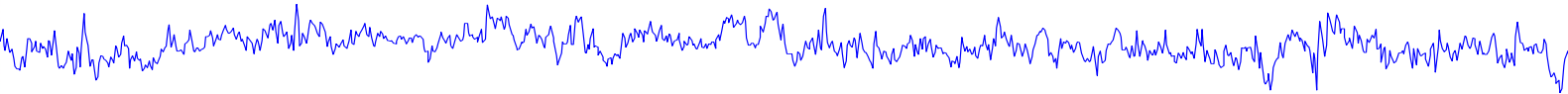
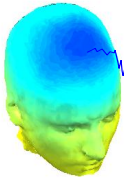
1. Co-register electrodes with model
2. Autofit, plot dipoles, fine fit
3. 3D headplot co-registration



Plot scalp maps in 3D



Headplot co-registration



Component head plot(s) -- pop_headplot()

Co-register channel locations with head mesh and compute a mesh spline file (done only once)

☐ Use the following spline file or structure

☒ Or (re)compute a new spline file named:

3-D head mesh file

Mesh associated channel file

Talairach-model transformation matrix

/home/julie/S01_attend1_pos1.spl

mheadnew.mat

mheadnew.xyz

Browse

Help

Browse

Help

Browse

Browse

Manual coreg.

1:31

Components of dataset:

Ok

coregister()

File Edit View Insert Tools Desktop Window Help

Labels off

Electrodes

Labels on

Electrodes

Mesh off

Help me

Func. help

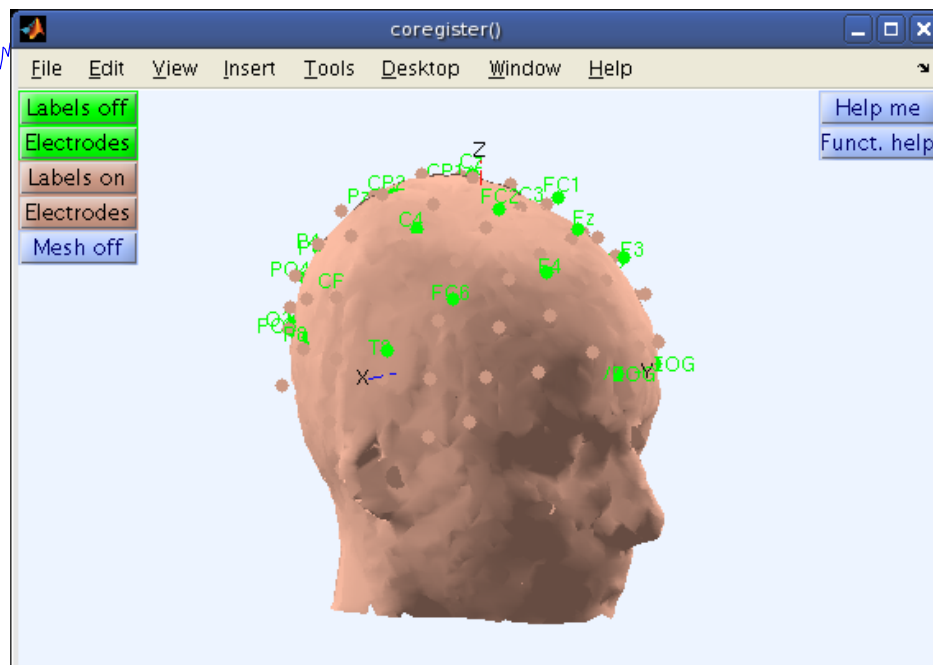
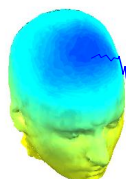
Go through co-registration in the same way as with dipfit co-registration

Move right {mm} 0 Pitch (rad) 0 Resize {x} 90.87 Align fiducials

Move front {mm} 0 Roll (rad) 0 Resize {y} 90.87 Warp montage

Move up {mm} 0 Yaw (rad) 0 Resize {z} 90.87 Cancel Ok

Confirm headplot co-registration



Component head plot(s) -- pop_headplot()

Co-register channel locations with head mesh and compute a mesh spline file (done only once)

☐ Use the following spline file or structure

☒ Or (re)compute a new spline file named:

3-D head mesh file

Mesh associated channel file

Talairach-model transformation matrix

/home/julie/S01_attend1_pos1.spl	Browse	Help
mheadnew.mat	Browse	Help
mheadnew.xyz	Browse	
0 0 -1.570796 100 76 90.87264	Manual coreg.	

Plot interpolated activity onto 3-D head

Component numbers to plot (negative numbers invert comp. polarities):

Plot title:

Plot geometry (rows,columns): (Default [] = near square)

-> headplot() options (See >> help headplot):

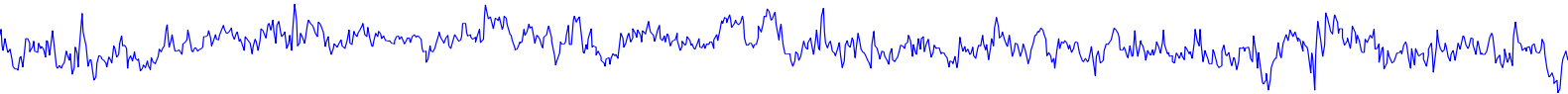
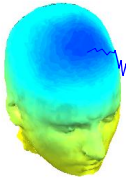
1:31

Components of dataset:

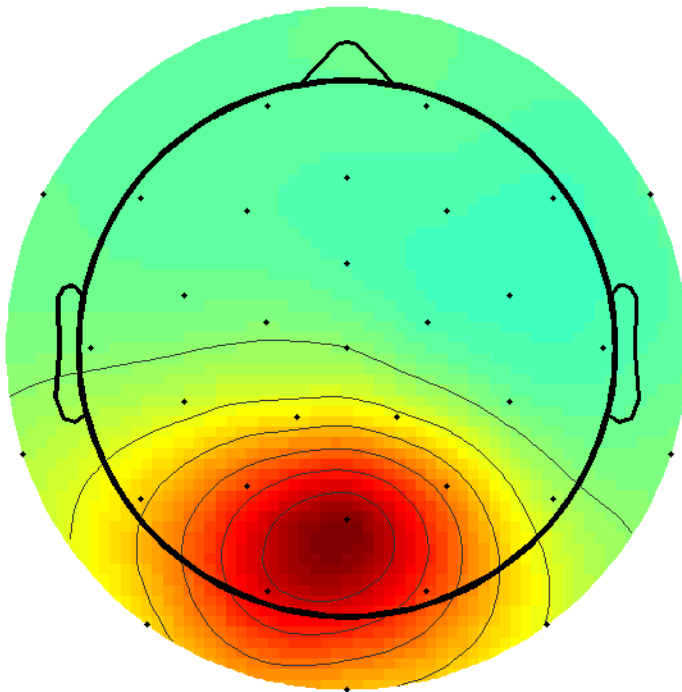
Cancel

Ok

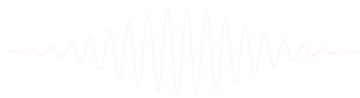
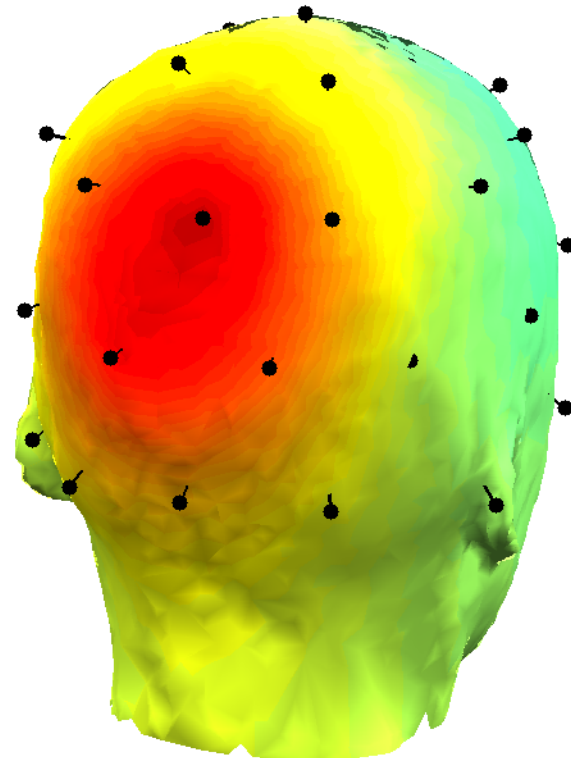
Spline file in EEG structure



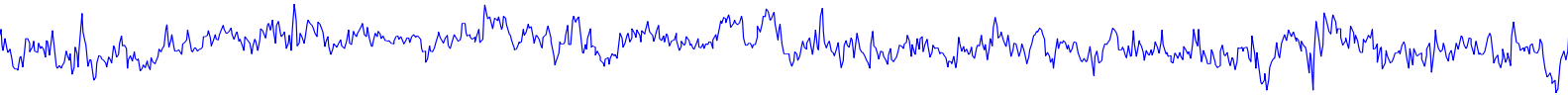
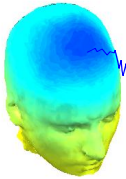
2D scalp map for IC 12



3D scalp map for IC 12



Exercise



- **Novice / Intermediate**
 - Load 'stern_125.set'
 - Practice co-registering electrodes with **BEM** model (choose 'Erase' because this dataset has co-registration done already)
 - Autofit IC dipoles
 - Fine fit dipoles
 - Plot dipoles from the GUI; scroll through components individually
 - Co-register the head model for 3D scalp map plotting. Then plot some ICs in 3D
- **Advanced**
 - In the Finefit menu, try fitting a bilateral dipole, what happens to the residual variance?
 - Try plotting a subset of dipoles in 'summary mode'

