# How to run SIFT simulation

From SCCN

This page shows an unofficial introduction for using SIFT simulator.

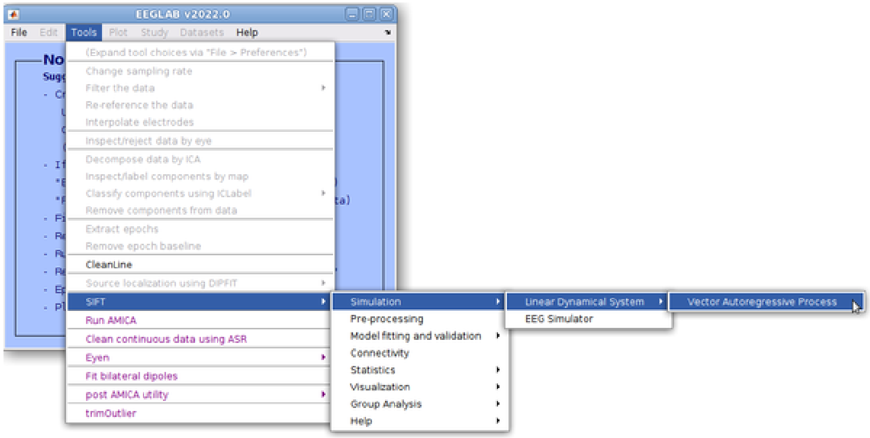
## Contents

# Linear Dynamical System-Vector Autoregressive process

## Example 1: Schelter 2009 Eq 3.1 (08/30/2022 Added)

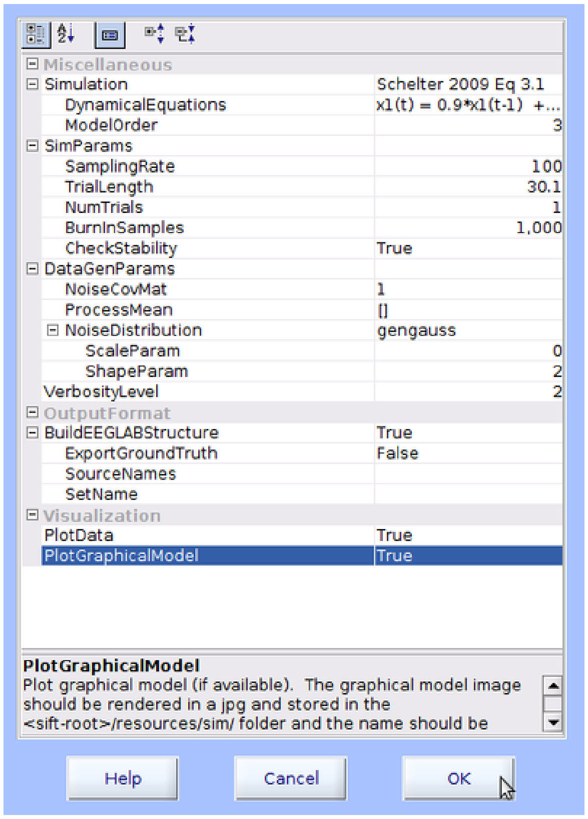
The following demonstration was confirmed to be performed under the following environment: Fedora 28, Matlab R2021a, EEGLAB 2022.0, SIFT 1.52.

## 1. Select 'SIFT'->'Simulation'->'Linear Dynamical System'->'Vector Autoregressive Process'



## 2. Set parameters

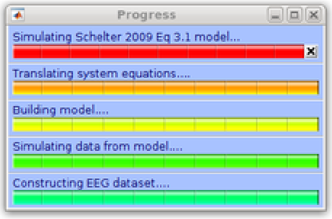
Set 'Semulation', 'Schelter 2009 Eq 3.1'; 'TrialLength', 30.1 (s); 'NumTrials', 1. These numbers follow Schelter et al. (2009). The sampling rate does not matter, use the default 100 (Hz). Under 'NoiseDistribution', set 'ScaleParams' 0 to set the amount of noise zero.



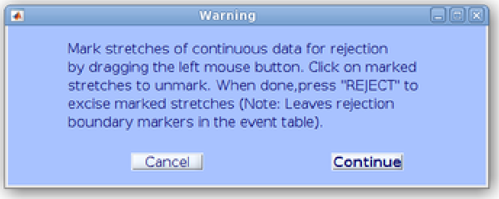
| | |
|---|---|
| ⊟ Miscellaneous | |
| ⊟ Simulation | Schelter 2009 Eq 3.1 |
| DynamicalEquations | x1(t) = 0.9*x1(t-1) +... |
| ModelOrder | 3 |
| ⊟ SimParams | |
| SamplingRate | 100 |
| TrialLength | 30.1 |
| NumTrials | 1 |
| BurnInSamples | 1,000 |
| CheckStability | True |
| ⊟ DataGenParams | |
| NoiseCovMat | 1 |
| ProcessMean | [] |
| ⊟ NoiseDistribution | gengauss |
| ScaleParam | 0 |
| ShapeParam | 2 |
| VerbosityLevel | 2 |
| ⊟ OutputFormat | |
| ⊟ BuildEEGLABStructure | True |
| ExportGroundTruth | False |
| SourceNames | |
| SetName | |
| ⊟ Visualization | |
| PlotData | True |
| PlotGraphicalModel | True |

**PlotGraphicalModel**
Plot graphical model (if available). The graphical model image should be rendered in a jpg and stored in the <sift-root>/resources/sim/ folder and the name should be

## 3. Run the process

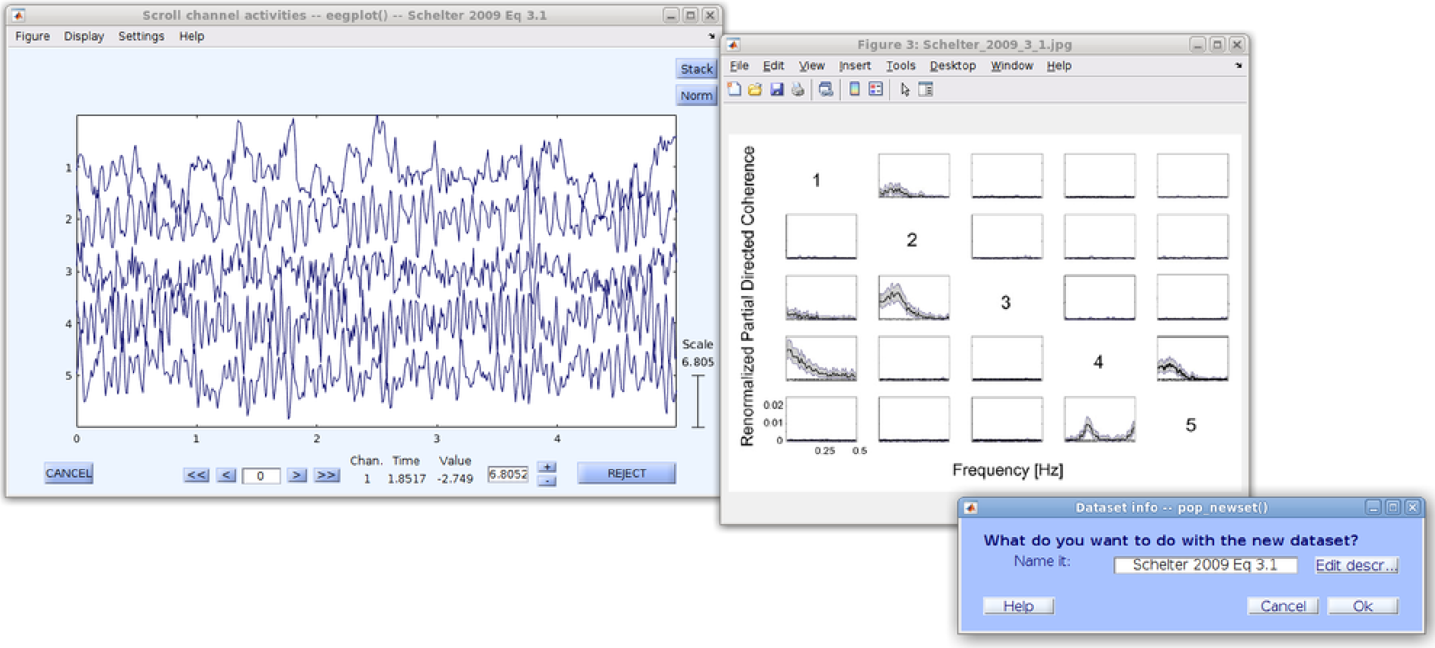


Simulating Schelter 2009 Eq 3.1 model...
Translating system equations....
Building model....
Simulating data from model....
Constructing EEG dataset....



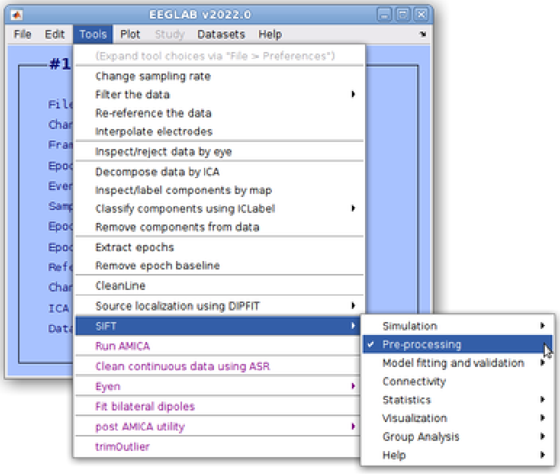
Mark stretches of continuous data for rejection by dragging the left mouse button. Click on marked stretches to unmark. When done,press "REJECT" to excise marked stretches (Note: Leaves rejection boundary markers in the event table).

### 4. Confirm the simulated signals


Scroll channel activities -- eegplot() -- Schelter 2009 Eq 3.1
Figure Display Settings Help
Stack
Norm
1
2
3
4
5
Scale
6.805
0 1 2 3 4
CANCEL
<< < 0 > >>
Chan. Time Value
1 1.8517 -2.749
6.8052
+
-
REJECT
Figure 3: Schelter_2009_3_1.jpg
File Edit View Insert Tools Desktop Window Help
Renormalized Partial Directed Coherence
1
2
3
4
5
0.02
0.01
0
0.25 0.5
Frequency [Hz]
Dataset info -- pop_newset()
Help
Cancel
Ok

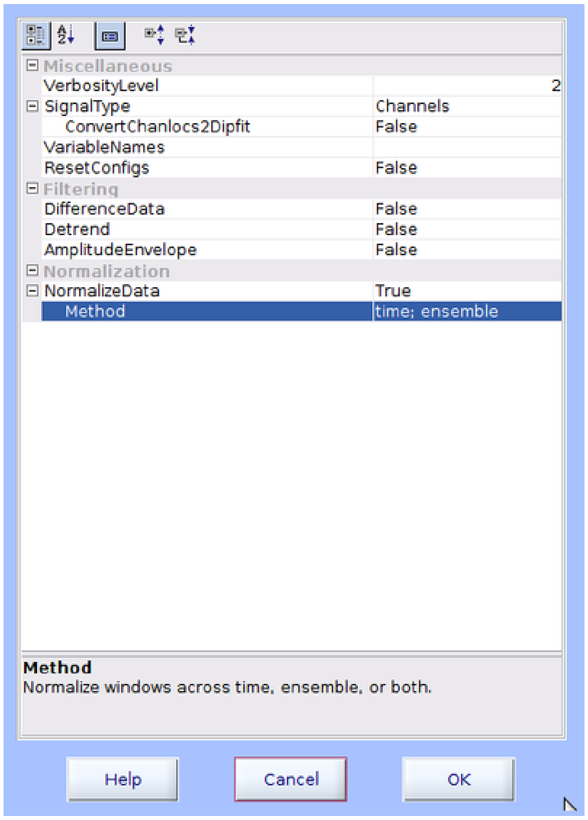
What do you want to do with the new dataset?
Name it: Schelter 2009 Eq 3.1 Edit descr...

### 5. Preprocess the simulated data



### 6. Set parameters

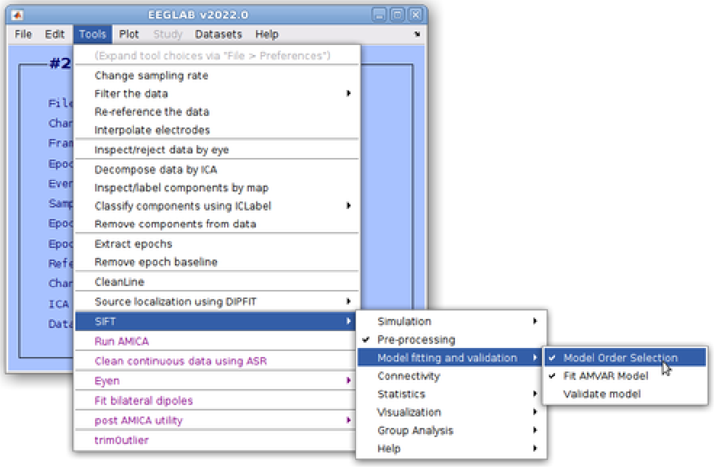
Change the 'Signal Type' to 'Channels', 'ConvertChanlocs2Dipfit' to 'False'.



| | |
|---|---|
| ⊟ Miscellaneous | |
| VerbosityLevel | 2 |
| ⊟ SignalType | Channels |
| ConvertChanlocs2Dipfit | False |
| VariableNames | |
| ResetConfigs | False |
| ⊟ Filtering | |
| DifferenceData | False |
| Detrend | False |
| AmplitudeEnvelope | False |
| ⊟ Normalization | |
| ⊟ NormalizeData | True |
| Method | time; ensemble |

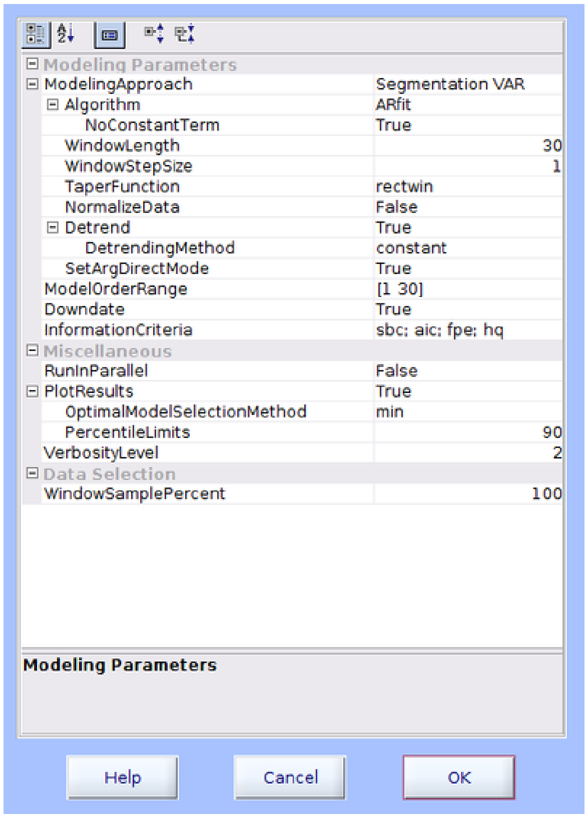
**Method**
Normalize windows across time, ensemble, or both.

### 7. Select 'SIFT'->'Model fitting and validation'->'Model Order Selection'



### 8. Set parameters

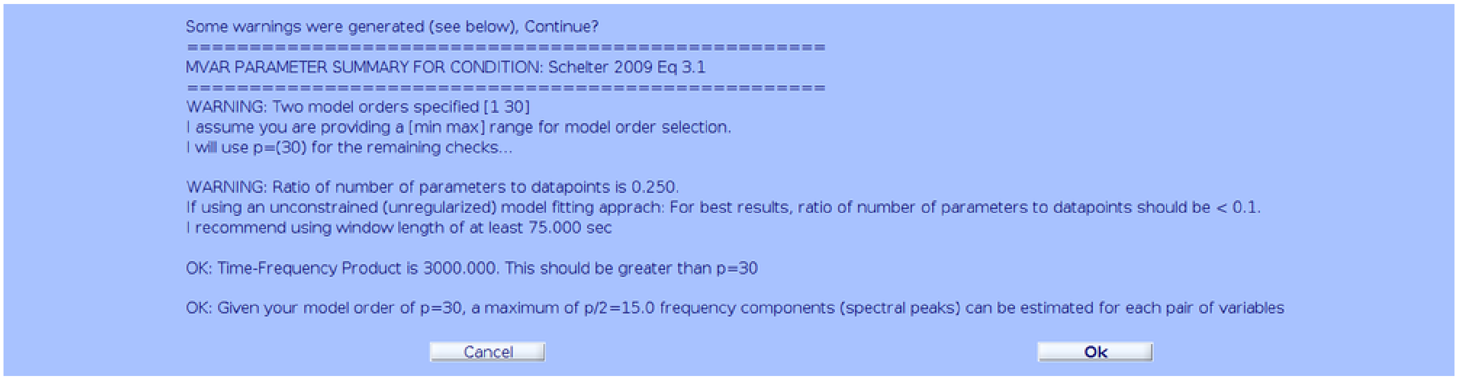
Change 'Algorithm' to 'ARfit'. This is not critical, but 'ARfit' gives slightly more exaggerated minimum dip than the default 'Vieira-Morf'. Confirm all the four methods suggests the model order 3. Set the 'WindowLength' 30, 'WindowStepSize', 1. With this setting, the window length == data length. This changes the behavior of SIFT and the result shows frequency domain result (very nice work, Tim...) The original Schelter et al. (2009) used the maximum model order 50. We can use this number if we want, but it does not affect the result at all.



```
⊟ Modeling Parameters
⊟ ModelingApproach                Segmentation VAR
   ⊟ Algorithm                    ARfit
        NoConstantTerm            True
     WindowLength                                   30
     WindowStepSize                                  1
     TaperFunction                rectwin
     NormalizeData                False
   ⊟ Detrend                      True
        DetrendingMethod          constant
     SetArgDirectMode             True
  ModelOrderRange                 [1 30]
  Downdate                        True
  InformationCriteria             sbc; aic; fpe; hq
⊟ Miscellaneous
  RunInParallel                   False
⊟ PlotResults                     True
     OptimalModelSelectionMethod  min
     PercentileLimits                               90
  VerbosityLevel                                     2
⊟ Data Selection
  WindowSamplePercent                              100

Modeling Parameters
```

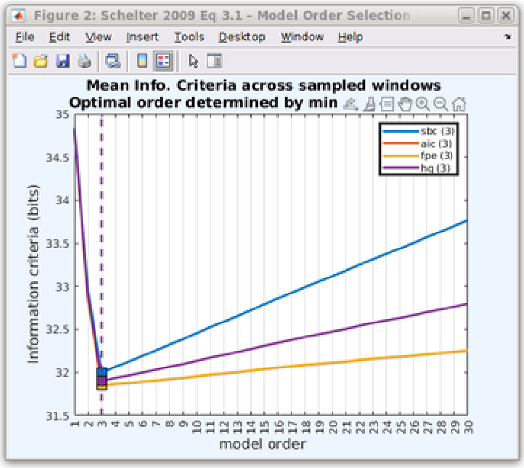
## 9. Neglect the warning

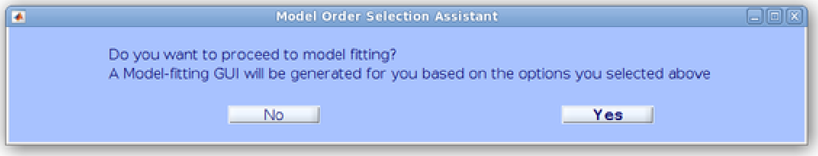
About the warning of *datapoint-to-parameter ratio*, see this article (https://sccn.ucsd.edu/wiki/Makoto%27s_preprocessing_pipeline#Caution_for_evaluating_the_datapoint-to-parameter_ratio_.2808.2F06.2F2019_updated.29) .



```
Some warnings were generated (see below), Continue?
=====================================================
MVAR PARAMETER SUMMARY FOR CONDITION: Schelter 2009 Eq 3.1
=====================================================
WARNING: Two model orders specified [1 30]
I assume you are providing a [min max] range for model order selection.
I will use p=(30) for the remaining checks...

WARNING: Ratio of number of parameters to datapoints is 0.250.
If using an unconstrained (unregularized) model fitting apprach: For best results, ratio of number of parameters to datapoints should be < 0.1.
I recommend using window length of at least 75.000 sec

OK: Time-Frequency Product is 3000.000. This should be greater than p=30

OK: Given your model order of p=30, a maximum of p/2=15.0 frequency components (spectral peaks) can be estimated for each pair of variables
```

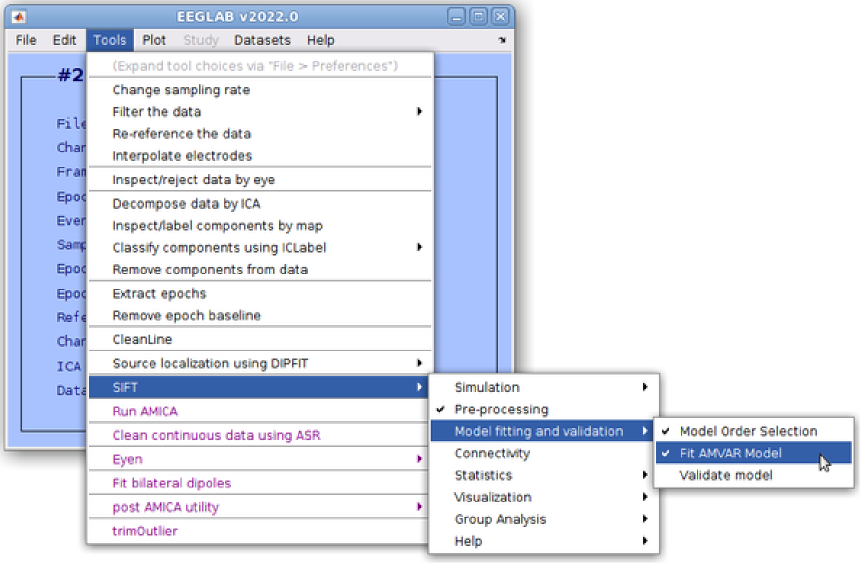
## 10. Confirm that the suggested model order is the same as the ground truth





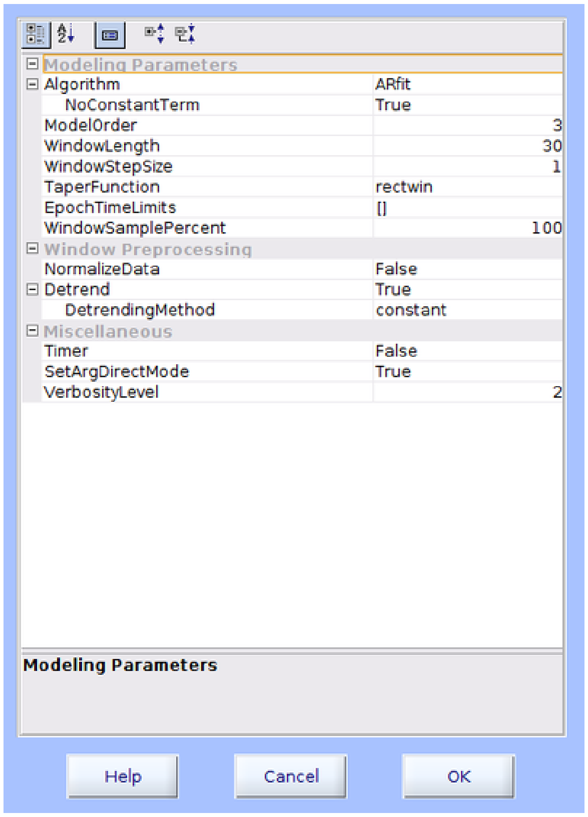
Do you want to proceed to model fitting?
A Model-fitting GUI will be generated for you based on the options you selected above

## 11. Select 'SIFT'->'Model fitting and validation'->'Fit AMVAR model'



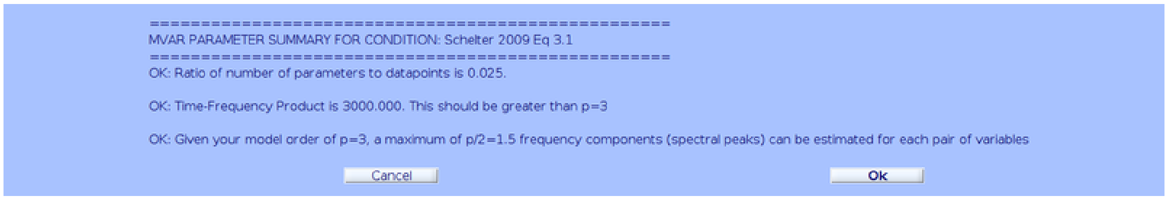
## 12. Set parameters

Set 'Algorithm' 'ARfit' for the sake of consistency; 'Model Order', 3; 'WindowLength', 30; 'WindowStepSize', 1.



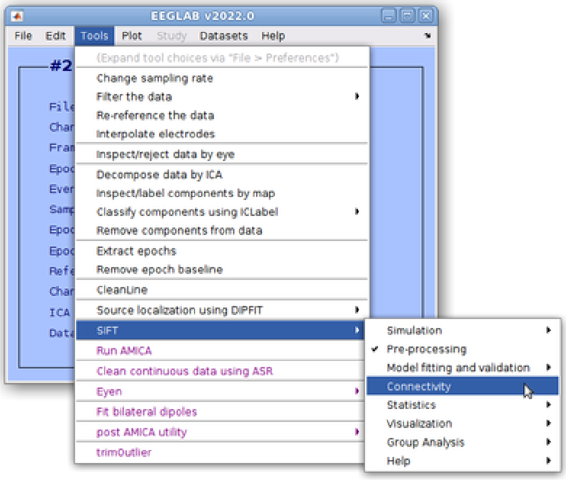
```
⊟ Modeling Parameters
⊟ Algorithm                  ARfit
     NoConstantTerm          True
  ModelOrder                                3
  WindowLength                             30
  WindowStepSize                            1
  TaperFunction              rectwin
  EpochTimeLimits            []
  WindowSamplePercent                     100
⊟ Window Preprocessing
  NormalizeData              False
⊟ Detrend                    True
     DetrendingMethod        constant
⊟ Miscellaneous
  Timer                      False
  SetArgDirectMode           True
  VerbosityLevel                            2

Modeling Parameters
```

### 13. Confirm the results from the status check



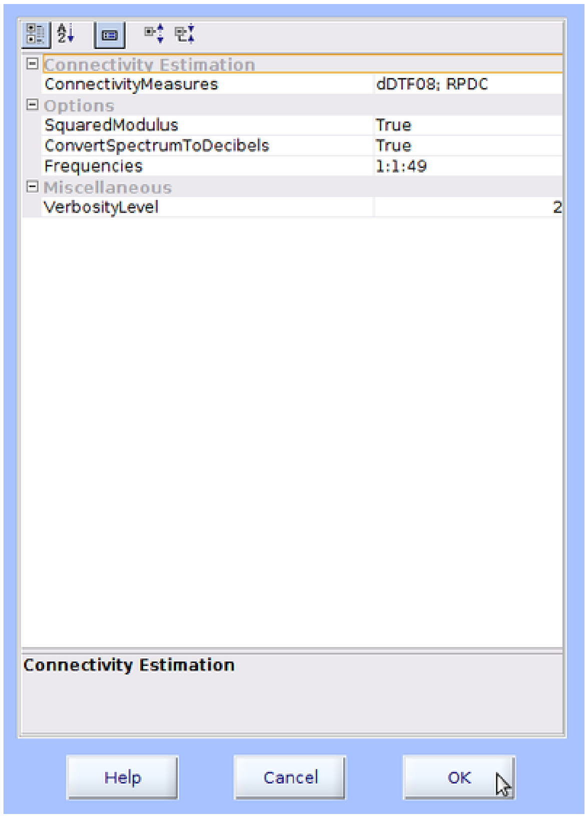
```
=================================================
MVAR PARAMETER SUMMARY FOR CONDITION: Schelter 2009 Eq 3.1
=================================================
OK: Ratio of number of parameters to datapoints is 0.025.

OK: Time-Frequency Product is 3000.000. This should be greater than p=3

OK: Given your model order of p=3, a maximum of p/2=1.5 frequency components (spectral peaks) can be estimated for each pair of variables
```

### 14. Select 'SIFT'->'Connectivity'



### 15. Set parameters

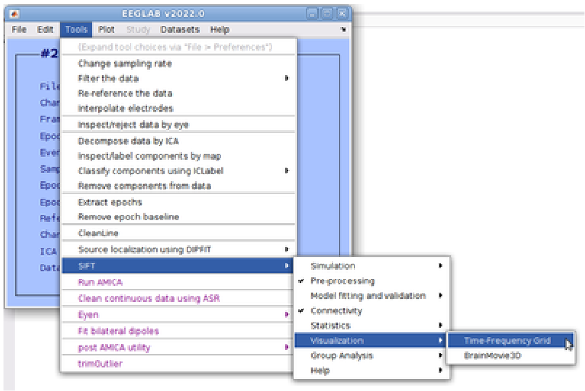
Select 'ConnectivityMeasures', 'dDTF08' and 'RPDC'; 'ConvertSpectrumToDecibels', 'True' (though it is not used).



| | |
|---|---|
| ⊟ Connectivity Estimation | |
| ConnectivityMeasures | dDTF08; RPDC |
| ⊟ Options | |
| SquaredModulus | True |
| ConvertSpectrumToDecibels | True |
| Frequencies | 1:1:49 |
| ⊟ Miscellaneous | |
| VerbosityLevel | 2 |

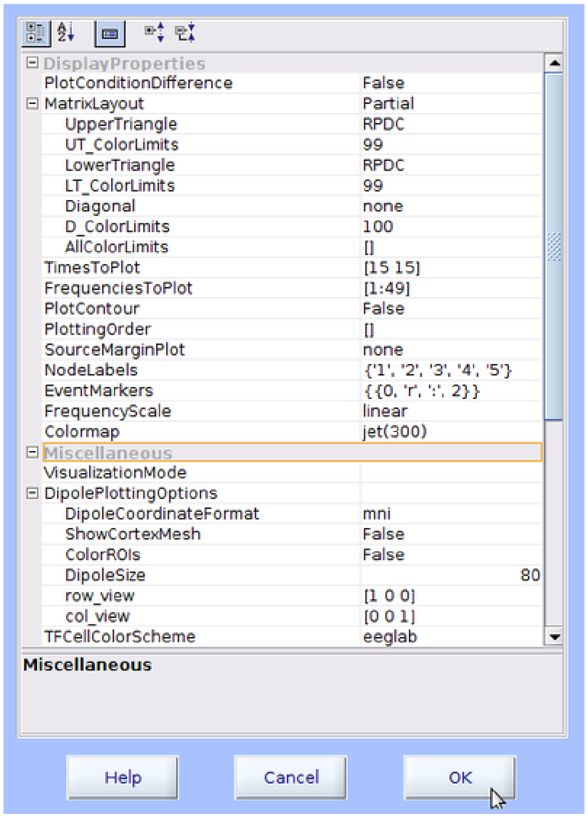
**Connectivity Estimation**

## 16. Select 'SIFT'->'Visualization'->'Time-Frequency Grid'



## 17. Set parameters

Change 'PlotConditionDifference', 'False'; 'MatrixLayout', 'Partial'; 'UpperTriangle', 'RPDC'; 'UT_ColorLimits', 99 (which is not used, probably); 'LowerTriangle', 'RPDC'; 'LT_ColorLimits', 99.



| | |
|---|---|
| ⊟ DisplayProperties | |
| PlotConditionDifference | False |
| ⊟ MatrixLayout | Partial |
| UpperTriangle | RPDC |
| UT_ColorLimits | 99 |
| LowerTriangle | RPDC |
| LT_ColorLimits | 99 |
| Diagonal | none |
| D_ColorLimits | 100 |
| AllColorLimits | [] |
| TimesToPlot | [15 15] |
| FrequenciesToPlot | [1:49] |
| PlotContour | False |
| PlottingOrder | [] |
| SourceMarginPlot | none |
| NodeLabels | {'1', '2', '3', '4', '5'} |
| EventMarkers | {{0, 'r', ':', 2}} |
| FrequencyScale | linear |
| Colormap | jet(300) |
| ⊟ Miscellaneous | |
| VisualizationMode | |
| ⊟ DipolePlottingOptions | |
| DipoleCoordinateFormat | mni |
| ShowCortexMesh | False |
| ColorROIs | False |
| DipoleSize | 80 |
| row_view | [1 0 0] |
| col_view | [0 0 1] |
| TFCellColorScheme | eeglab |

Miscellaneous

## 18. Compare the SIFT results with those reported by the reference paper

Left, Schelter et al. (2009) Figure 1; Middle, the RPDC results; Right, the dDTF08 results. Note the frequency scaled used in the left panel refers to the normalized frequency (probably) i.e. 0.5 means the half of the Nyquist Frequency of the current sampling rate 100Hz.

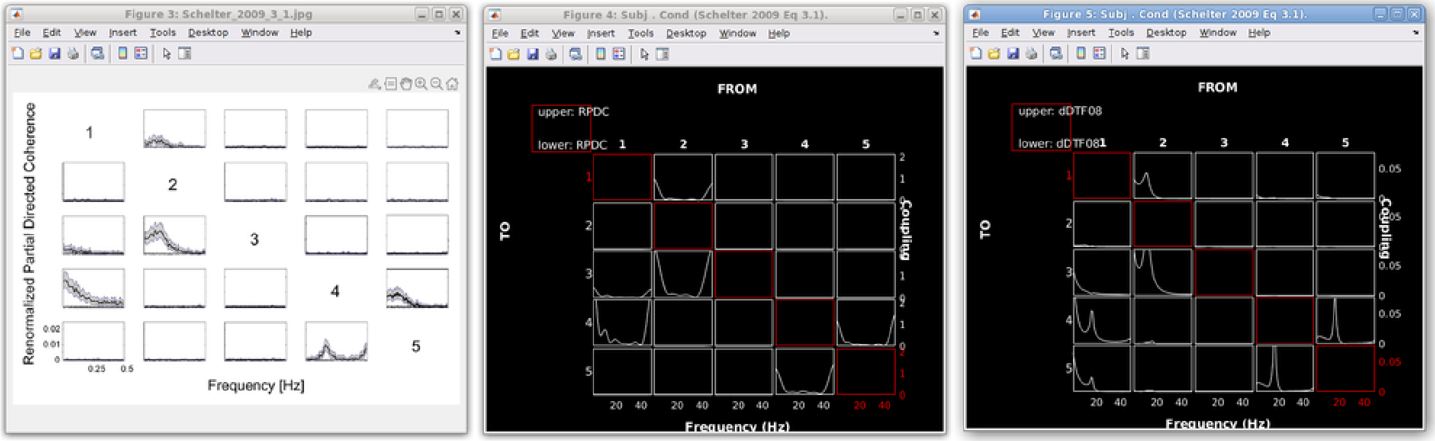


Figure 3: Schelter_2009_3_1.jpg
Renormalized Partial Directed Coherence
Frequency [Hz]
1
2
3
4
5
0.02
0.01
0
0.25
0.5
Figure 4: Subj . Cond (Schelter 2009 Eq 3.1).
FROM
TO
upper: RPDC
lower: RPDC
Coupling
Frequency (Hz)
20
40
Figure 5: Subj . Cond (Schelter 2009 Eq 3.1).
upper: dDTF08
lower: dDTF08
0.05

# Example 2: Epileptic Seizure

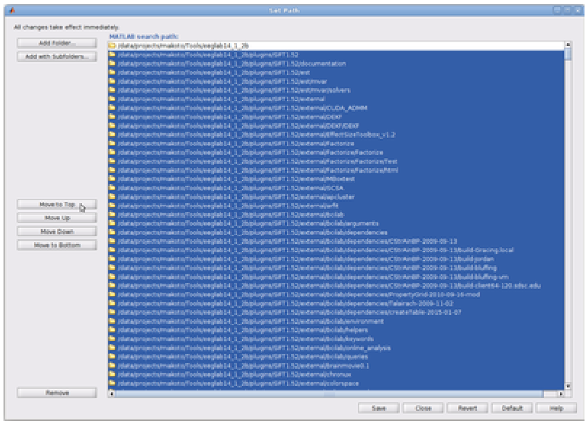
The following demonstration was confirmed to be performed under the following environment: Fedora 28, Matlab R2017b, EEGLAB 14.1.2, SIFT 1.52.

## Obsolete info for EEGLAB 14 (08/30/2022 updated)

First of all, you have to have EEGLAB and SIFT downloaded, installed, and launched successfully. Now, SIFT may contain several functions that have the same name as other functions. For example, several versions of 'PropertyGrid' could be found in your paths. To find them out, try the following code on the command line.

```
which -all PropertyGrid
```

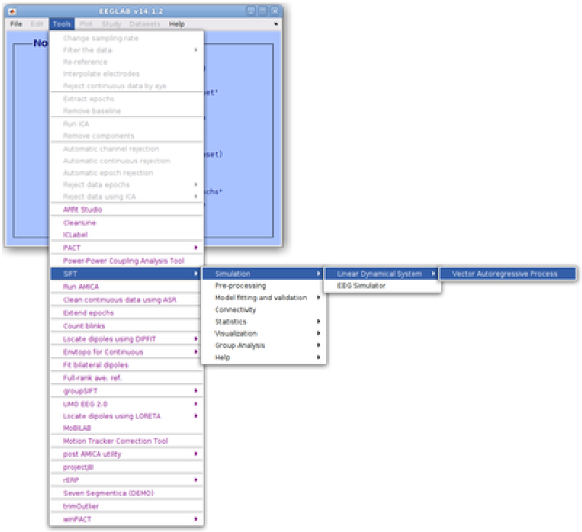
You may have only one included by SIFT, or you may have more than one. In any case, we **need** to make sure (i.e. otherwise it won't work) that all the functions called from SIFT should refer to those contained by SIFT itself. From Matlab GUI, 'Home'-'Set Path', select all SIFT-related paths by pressing shift button while selecting all of them, press 'Move to Top', then 'Save' and 'Close'.



```
/data/projects/makoto/Tools/eeglab14_1_2b
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/documentation
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/est
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/est/mvar
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/est/mvar/solvers
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/CUDA_ADMM
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/DEKF
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/DEKF/DEKF
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/EffectSizeToolbox_v1.2
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/Factorize
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/Factorize/Factorize
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/Factorize/Factorize/Test
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/Factorize/Factorize/html
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/MBoxtest
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/SCSA
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/apcluster
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/arfit
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/arguments
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/dependencies
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/dependencies/CStrAinBP-2009-09-13
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/dependencies/CStrAinBP-2009-09-13/build-Gracing.local
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/dependencies/CStrAinBP-2009-09-13/build-jordan
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/dependencies/CStrAinBP-2009-09-13/build-bluffing
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/dependencies/CStrAinBP-2009-09-13/build-bluffing.um
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/dependencies/CStrAinBP-2009-09-13/build-client64-120.sdsc.edu
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/dependencies/PropertyGrid-2010-09-16-mod
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/dependencies/Talairach-2009-11-02
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/dependencies/createTable-2015-01-07
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/environment
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/helpers
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/keywords
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/online_analysis
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/bcilab/queries
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/brainmovie0.1
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/chronux
/data/projects/makoto/Tools/eeglab14_1_2b/plugins/SIFT1.52/external/colorspace
```

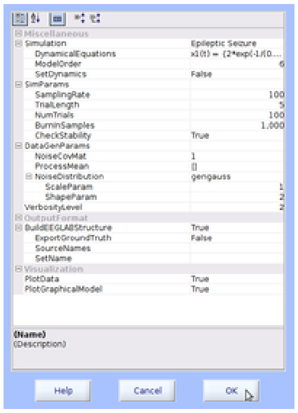
## Select the GUI menu item

This is easy, just click the rightmost menu item. This corresponds to generate simulated sources. If you want to obtain their scalp projection, see below for 'EEG simulator'.



## Launch PropertyGrid GUI to accept user inputs

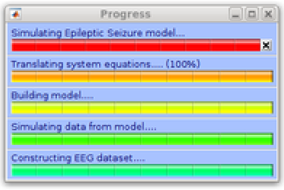
This is the famous PropertyGrid used everywhere in EEGLAB plugins. The menu items are self descriptive. The most important parameter here would be the top one labeled 'Simulation'. When you click it, you'll find 8 items in a list. Choose the first model labeled 'Epileptic Seizure'. Press 'OK' to start the process.



```
⊟ Miscellaneous
⊟ Simulation                    Epileptic Seizure
    DynamicalEquations          x1(t) = {2*exp(-1/(0...
    ModelOrder                                     6
    SetDynamics                 False
⊟ SimParams
    SamplingRate                                 100
    TrialLength                                    5
    NumTrials                                    100
    BurninSamples                              1,000
    CheckStability              True
⊟ DataGenParams
    NoiseCovMat                 1
    ProcessMean                 []
  ⊟ NoiseDistribution           gengauss
      ScaleParam                                   1
      ShapeParam                                   2
  VerbosityLevel                                   2
⊟ OutputFormat
⊟ BuildEEGLABStructure          True
    ExportGroundTruth           False
    SourceNames
    SetName
⊟ Visualization
  PlotData                      True
  PlotGraphicalModel            True

(Name)
(Description)
```

## Wait until the progress bar reaches the end

You'll see the 5 rainbow-colored bars that shows progress of the processes. It won't take more than 10 s if you choose the default parameters on the previous window. When calculation is done, the EEGLAB function pops up. This is unrelated to the current simulation, so press 'OK' to continue.



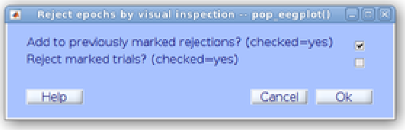
Simulating Epileptic Seizure model...

Translating system equations.... (100%)

Building model....

Simulating data from model....

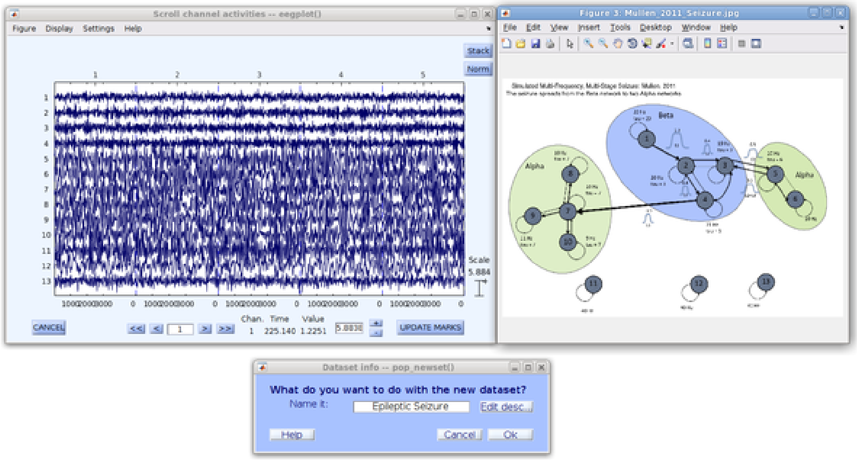
Constructing EEG dataset....



Add to previously marked rejections? (checked=yes) ☑
Reject marked trials? (checked=yes) □

## Confirm the results

When calculation is done, you'll see these three windows pop up. The index numbers in the time-series data plot correspond to the index numbers used on the right schematic model. Press 'OK' to continue.


Scroll channel activities -- eegplot()
Figure Display Settings Help
Stack
Norm
1
2
3
4
5
1
2
3
4
5
6
7
8
9
10
11
12
13
Scale
5.884
CANCEL
<<
<
1
>
>>
UPDATE MARKS
Figure 3: Mullen_2011_Seizure.jpg
File Edit View Insert Tools Desktop Window Help
Beta
Alpha
Alpha
1
2
3
4
5
6
7
8
9
10
11
12
13
Dataset info -- pop_newset()

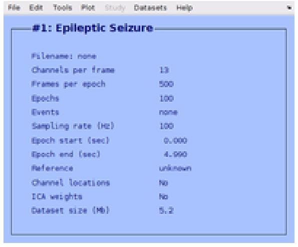
Chan. Time Value
1 225.140 1.2251

What do you want to do with the new dataset?
Name it: Epileptic Seizure

Edit desc...
Help
Cancel
Ok

## Confirm the updated EEGLAB GUI

Now you see the updated EEGLAB main GUI. Confirm the number of channels (13), the number of epochs (100), sampling rate (this is 100Hz, not 1000Hz!), epoch length (5 s).



#1: Epileptic Seizure

```
Filename: none
Channels per frame        13
Frames per epoch          500
Epochs                    100
Events                    none
Sampling rate (Hz)        100
Epoch start (sec)          0.000
Epoch end (sec)            4.990
Reference                 unknown
Channel locations         No
ICA weights               No
Dataset size (Mb)         5.2
```

If you continue to analyze this data using SIFT, then you should be able to replicate the relations shown in the schematic illustration.

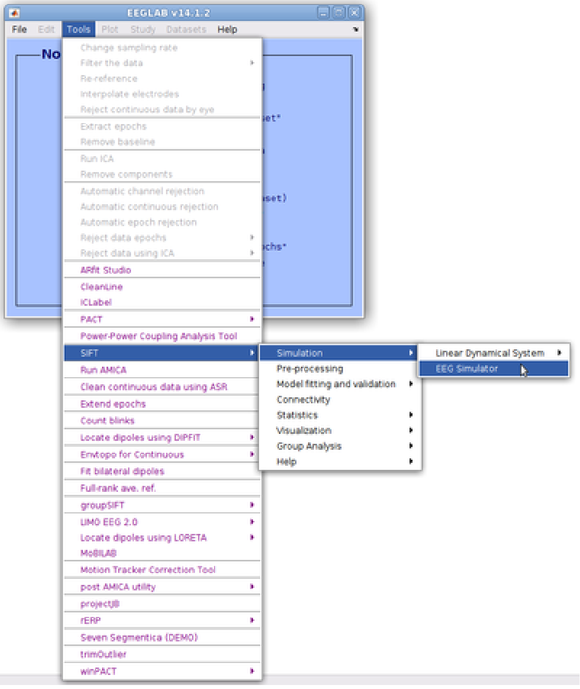
### Access to the generated data

The generated 13-channel data are stored in EEG.data which has the size of 13 x 500 x 100 for channel, time points, and trials (epochs), respectively. To process this data using SIFT functions, follow the Example 1 above.

# EEG Simulator

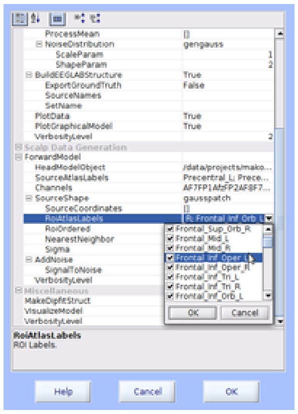
## Select the GUI menu item

This GUI menu generates 1) the simulated sources as shown above, then 2) project them to scalp EEG channels. To perform source-to-scalp projection, it uses pre-computed 90-anatomical region atlas and international 10-10 system 64-ch scalp recording sensor labels and locations. This template information is included by the downloaded SIFT package and no need to take any action to set it up.



## Launch PropertyGrid GUI to accept user inputs

This window is important because **just pressing 'OK' does not work**. You have to first choose a model from the top GUI menu. As described, we select 'Epileptic Seizure'. This means that there will be 13 sources in the model. We need to specify the corresponding number of source locations by either entering their equivalent current dipole locations by xyz coordiantes (but in Talairach or MMN coordinate system? This needs to be clarified) or specifying their anatomical labels (looks like those used in AAL atlas by Tzourio-Mazoyer et al., 2002, but better to be confirmed also). For the test purpose, we choose the latter and click 13 check boxes for selecting anatomical labels from the dropdown menu under 'Scalp Data Generation'-'ForwardModel'-'SourceShape'-'RoiAtlasLabels'. You may choose any 13 regions for now to see if it works. When done, press 'OK'.



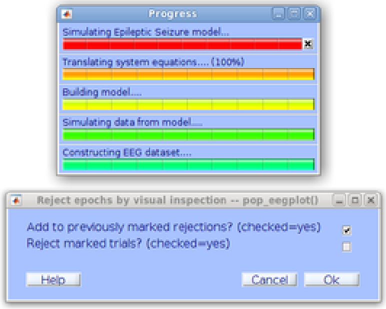
| | |
|---|---|
| ProcessMean | [] |
| ⊟ NoiseDistribution | gengauss |
| ScaleParam | 1 |
| ShapeParam | 2 |
| ⊟ BuildEEGLABStructure | True |
| ExportGroundTruth | False |
| SourceNames | |
| SetName | |
| PlotData | True |
| PlotGraphicalModel | True |
| VerbosityLevel | 2 |
| ⊟ Scalp Data Generation | |
| ⊟ ForwardModel | |
| HeadModelObject | /data/projects/mako... |
| SourceAtlasLabels | Precentral_L; Prece... |
| Channels | AF7FP1AfzFP2AF8F7... |
| ⊟ SourceShape | gausspatch |
| SourceCoordinates | [] |
| RoiAtlasLabels | R; Frontal_Inf_Orb_L |
| RoiOrdered | |
| NearestNeighbor | |
| Sigma | |
| ⊟ AddNoise | |
| SignalToNoise | |
| VerbosityLevel | |
| ⊟ Miscellaneous | |
| MakeDipfitStruct | |
| VisualizeModel | |
| VerbosityLevel | |

☑ Frontal_Sup_Orb_R
☑ Frontal_Mid_L
☑ Frontal_Mid_R
☑ Frontal_Inf_Oper_L
☑ Frontal_Inf_Oper_R
☑ Frontal_Inf_Tri_L
☑ Frontal_Inf_Tri_R
☑ Frontal_Inf_Orb_L

**RoiAtlasLabels**
ROI Labels.

## Wait until the progress bar reaches the end

If everything goes well, you do not need to do anything. Just watch the progress bar extending to the end. It took longer than just simulating the sources in my case.



Progress

Simulating Epileptic Seizure model...

Translating system equations.... (100%)

Building model....

Simulating data from model....

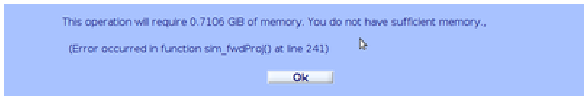
Constructing EEG dataset....

Reject epochs by visual inspection -- pop_eegplot()

Add to previously marked rejections? (checked=yes) ☑
Reject marked trials? (checked=yes) □

### What if I encounter this error?

I got this error message.



This operation will require 0.7106 GB of memory. You do not have sufficient memory.,

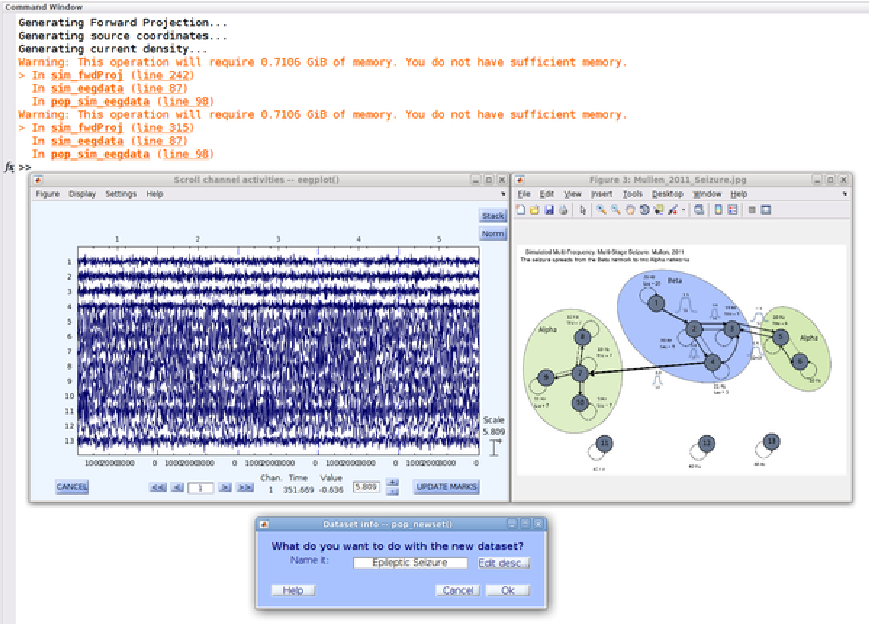
(Error occurred in function sim_fwdProj() at line 241)

Fortunately, I knew what it is through my experience with updating clean_rawdata (https://sccn.ucsd.edu/wiki/Artifact_Subspace_Reconstruction_(ASR)#The_option_.27availableRAM_GB.27_is_available_to_fix_the_length_of_final_output.) . And I know that **this may not cause the problem for most of non-Linux users** (unless you set a model with a crazily large number of network nodes.) This JAVA-based RAM check function returns very small amount for my environment (Fedora 28). I guess it depends on the definition of 'available RAM amount' by each OS. Even if the returned answer is 0.71 GB as in the example, there is much more RAM space available and HDD swap never occurs. You can always check how much RAM can be used via OS resource monitor. Based on this, I implemented the following change on sim_fwdProj.m. There are more than one place that has the same error function, but the first one appears in line 241. I suggest you replace the function *error()* to *warning()* to let the calculation continue.

```
%error('This operation will require %0.5g GiB of memory. You do not have sufficient memory.',bytesReq/1024^3);
warning('This operation will require %0.5g GiB of memory. You do not have sufficient memory.',bytesReq/1024^3); % 12/02/2019 Makoto. Modified.
```

# Confirm the results

When calculation is done, you will see the same set of figures. Note the two warning messages shown in the command line, which were generated by my mod suggested above. Note also that the 13 time-series data shown here refers to source activation, not the 64-channel projection yet.



Command Window

```
Generating Forward Projection...
Generating source coordinates...
Generating current density...
Warning: This operation will require 0.7106 GiB of memory. You do not have sufficient memory.
> In sim_fwdProj (line 242)
  In sim_eegdata (line 87)
  In pop_sim_eegdata (line 98)
Warning: This operation will require 0.7106 GiB of memory. You do not have sufficient memory.
> In sim_fwdProj (line 315)
  In sim_eegdata (line 87)
  In pop_sim_eegdata (line 98)
fx >>
```

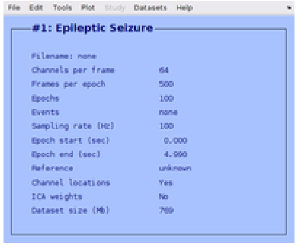
Scroll channel activities -- eegplot()
Figure Display Settings Help
Stack
Norm
Scale 5.809
CANCEL
Chan. Time Value
1 351.669 -0.636
5.809
UPDATE MARKS
Figure 3: Mullen_2011_Seizure.jpg
File Edit View Insert Tools Desktop Window Help
Simulated Multi-Frequency Multi-Stage Seizure: Mullen, 2011
The seizure spreads from the Beta network to the Alpha networks
Beta
Alpha
Alpha
Dataset info -- pop_newset()
Help
Cancel
Ok

What do you want to do with the new dataset?

Name it: Epileptic Seizure Edit desc.

# Confirm the updated EEGLAB GUI

Now you see the updated EEGLAB main GUI. Confirm the number of channels (64, not 13!), the number of epochs (100), sampling rate (this is 100Hz, not 1000Hz!), epoch length (5 s).



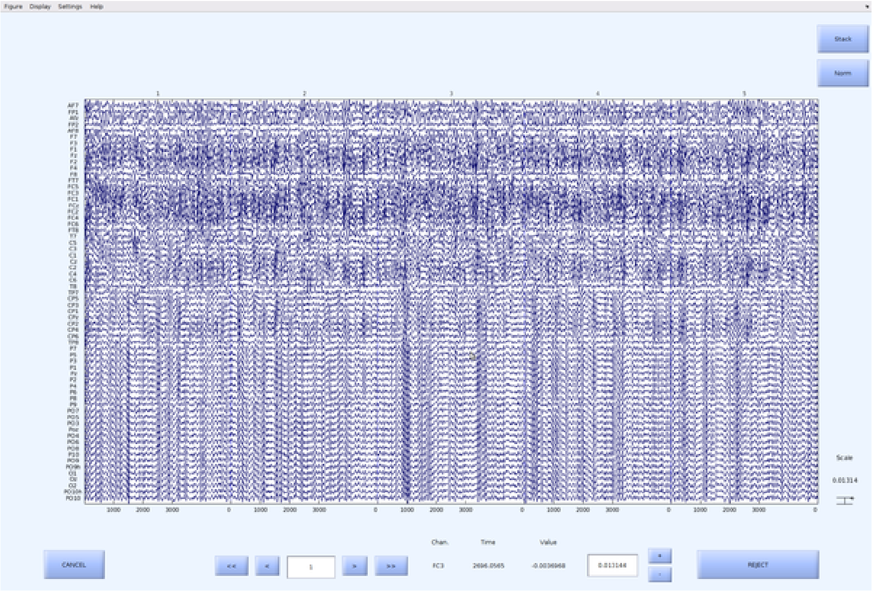
#1: Epileptic Seizure

Filename: none

| | |
|---|---|
| Channels per frame | 64 |
| Frames per epoch | 500 |
| Epochs | 100 |
| Events | none |
| Sampling rate (Hz) | 100 |
| Epoch start (sec) | 0.000 |
| Epoch end (sec) | 4.990 |
| Reference | unknown |
| Channel locations | Yes |
| ICA weights | No |
| Dataset size (Mb) | 769 |

# Confirm the scalp projection

To visually inspect the generated scalp projection 'recorded' at the scalp sensors, you have to manually open the scroll plot using EEGLAB function. 'Plot'-'Channel Data (Scroll)' opens the interactive GUI to browse the 64-ch time-series data.



## Access to the generated data

The generated 64-channel data are stored in EEG.data which has the size of 64 x 500 x 100 for channel, time points, and trials (epochs), respectively.

Author: Makoto Miyakoshi, Swartz Center for Computational Neuroscience (SCCN), Institute for Neural Computation (INC), UC San Diego
Retrieved from "https://sccn.ucsd.edu/mediawiki/index.php?title=How_to_run_SIFT_simulation&oldid=34160"

- This page was last modified on 30 August 2022, at 18:27.
- This page has been accessed 1,942 times.