

```

4  %% 1.5T simulation
5  % rng('default');
6  % rng(10);
7  D_SNR = randi([40,110],100,1)+randn(100,1);
8  for a = 1:5
9
10     D_SNR_a = D_SNR(a); %% SNR levels, this can be a CNR value as well Randomly generate number from 40 to 45
11     SNR_Mat(a,:) = D_SNR_a; %% save the SNR is the loop
12     % rng('default');rng(a);
13     nT_a = randi([50,100],1,1) ; %% number of subject Randomly generate number from 30 to 100
14     nT_Mat(a,:) = nT_a;
15     nV = 300; %% size of the image would be nV*nV
16     comp_ID = [3 8 9 11 16 17 19 20 21 22 23 25 26 29 30]; %% select 15 components
17     verbose_display = 0; %% if you want to see which components you've selected, reset this value to 1
18
19     mkdir(['C:\Simulation_Data\Simulation_1\sim_',sprintf('%02d',a)]); %% make a dictionary to save the simulated data
20     out_path = [['C:\Simulation_Data\Simulation_1\sim_',sprintf('%02d',a)]]; %%you need to change the out path of your own
21     sP = simulation_sMRI_simTB_ryg_20200717(nT_a,D_SNR_a,out_path,nV,comp_ID,verbose_display);
22     simtb_main_ryg_sMRI(sP);
23
24 end
25 cd('C:\Simulation_Data\Simulation_1');
26 save SNR_Mat_15T SNR_Mat;
27 save nT_Mat_15T nT_Mat;
28
29 cd('C:\Simulation_Data\Simulation_1');

```

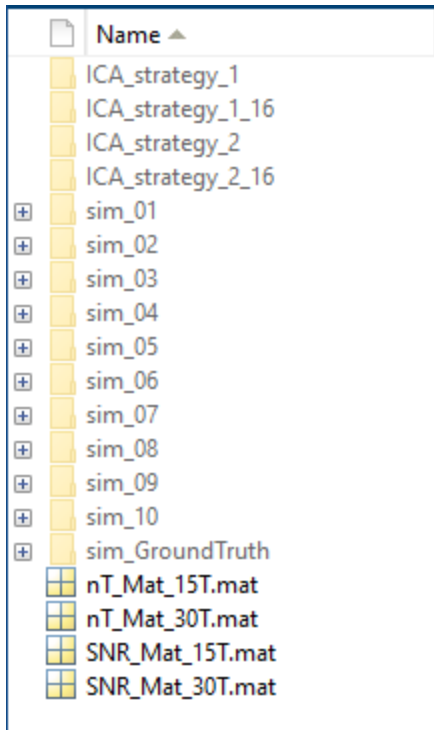
1. In line 13, change the range of the subjects from 50-100 to 30-100 for 1.5T, do the same for 3.0T, as well. Since this is the second time simulation, change all output direction to a new folder. Then you should have following files in your new folder. (code file: demo\_sim10sites.m)

```

Simulation_2
├── sim_01
├── sim_02
├── sim_03
├── sim_04
├── sim_05
├── sim_06
├── sim_07
├── sim_08
├── sim_09
├── sim_10
├── sim_GroundTruth
├── nT_Mat_15T.mat
├── nT_Mat_30T.mat
├── SNR_Mat_15T.mat
└── SNR_Mat_30T.mat

```

2. Before you go change the Strategy code, remember to add a few new folders as the output direction for the ICA results, your simulation data file should look like this.



- Now since we generated new data, the input and output direction in both strategy code need to be changed, and locate the iceMask.nii file which is contained in the [github](#) file, as well. (code file: batchICA\_strategy1.m [and](#) batchICA\_strategy2.m)

```

59 %% Method 4
60 % Input data file pattern for data-sets must be in a cell array. The no. of rows of cell array correspond to no. of subjects
61 % and columns correspond to sessions. In the below example, there are 3
62 % subjects and 1 session. If you have multiple sessions, please see
63 % Input_data_subjects_2.m file.
64 input_data_file_patterns = {'C:\Simulation_Data\Simulation_1\sim_01\Sim*.nii';
65                             'C:\Simulation_Data\Simulation_1\sim_02\Sim*.nii';
66                             'C:\Simulation_Data\Simulation_1\sim_03\Sim*.nii';
67                             'C:\Simulation_Data\Simulation_1\sim_04\Sim*.nii';
68                             'C:\Simulation_Data\Simulation_1\sim_05\Sim*.nii';
69                             'C:\Simulation_Data\Simulation_1\sim_06\Sim*.nii';
70                             'C:\Simulation_Data\Simulation_1\sim_07\Sim*.nii';
71                             'C:\Simulation_Data\Simulation_1\sim_08\Sim*.nii';
72                             'C:\Simulation_Data\Simulation_1\sim_09\Sim*.nii';
73                             'C:\Simulation_Data\Simulation_1\sim_10\Sim*.nii';};
74
75
76 %% Enter directory to put results of analysis
77 outputDir = 'C:\Simulation_Data\Simulation_1\ICA_strategy1_16';
78
79 %% Enter Name (Prefix) Of Output Files
80 prefix = 'ica';
81
82 %% Enter location (full file path) of the image file to use as mask
83 % or use Default mask which is []
84
85 %% Enter location (full file path) of the image file to use as mask
86 % or use Default mask which is []
87 maskFile = ['C:\Simulation_Data\MRI-ICA-remake\MRI-ICA-master\src\icaMask.nii'];

```

4. If you want your result display contains 16 or 15 diagrams in 1 picture, change line142-143.

```
139 %% Number of pc to reduce each subject down to at each reduction step
140 % The number of independent components the will be extracted is the same as
141 % the number of principal components after the final data reduction step.
142 - numOfPC1 = 16;
143 - numOfPC2 = 16;
144 % numOfPC3 = 25;
145
```

5. After you finished changing code in both strategy, open file run\_ICAbatch.m in matlab, and make sure the code finds the path of strategy code. (code file-: run\_ICAbatch.m)

```
4 - inputFiles = ['C:\Simulation_Data\MRI-ICA-remake\MRI-ICA-master\src\batchICA_strategy1.m'];
5 - icatb_batch_file_run(inputFiles);
6 - close all;clear;
7
8 - inputFiles = ['C:\Simulation_Data\MRI-ICA-remake\MRI-ICA-master\src\batchICA_strategy2.m'];
9 - icatb_batch_file_run(inputFiles);
10 - close all;clear;
```

6. Now run 'run\_ICAbatch.m', it might take a couple minutes. It's done when the command window shows

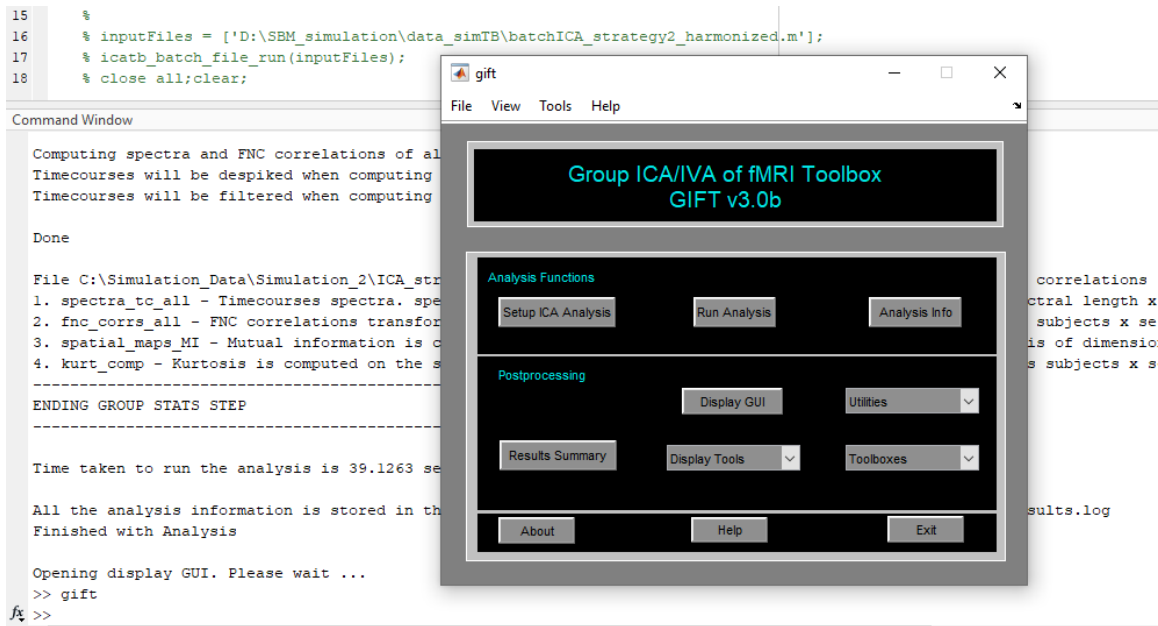
Time taken to run the analysis is 39.1263 seconds

All the analysis information is stored in the file C:\Simulation\_Data\Simulation\_2\ICA\_strategy\_2\_16\ica\_results.log  
Finished with Analysis

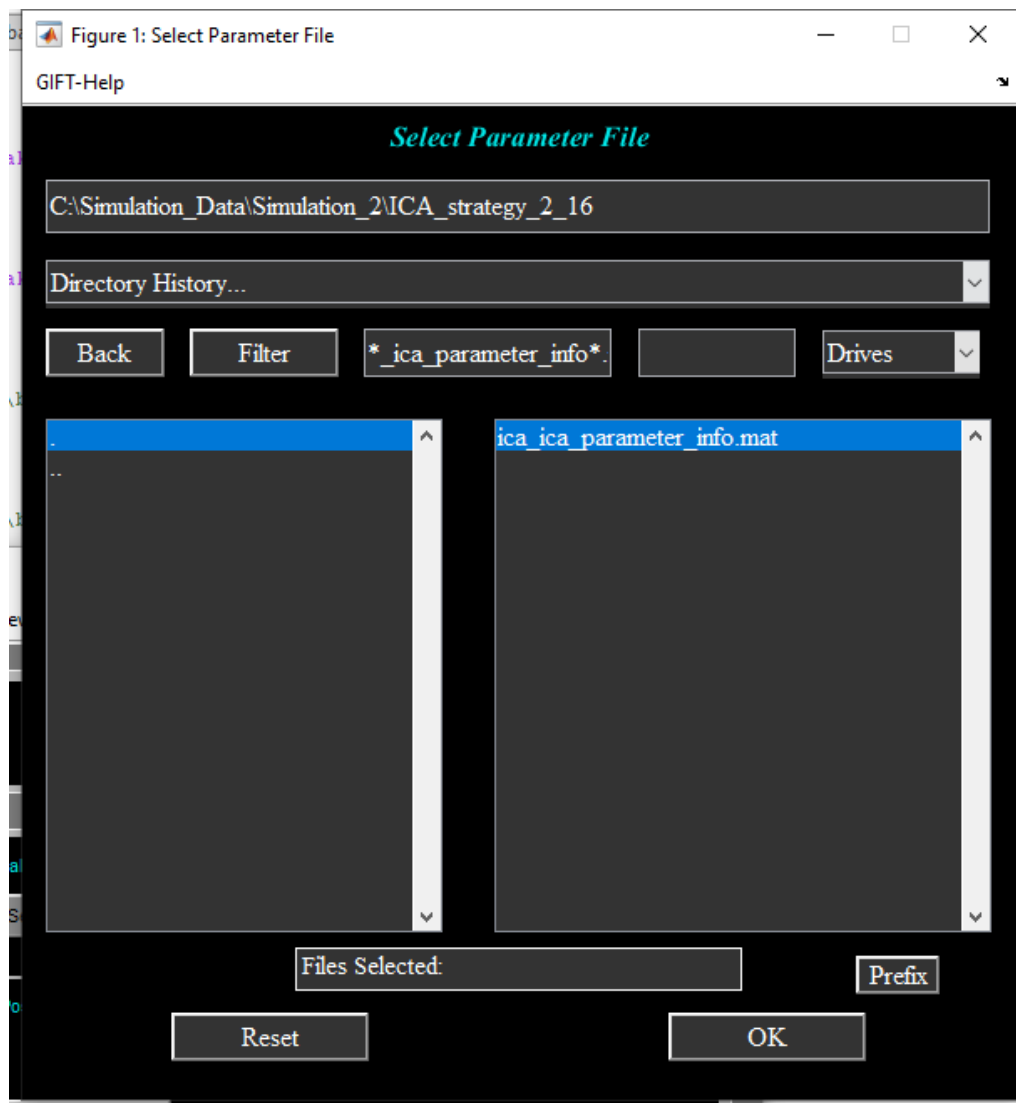
Opening display GUI. Please wait ...

at the very end.

7. Now type 'gift' in command window and press Enter, a toolbox like below will show up.



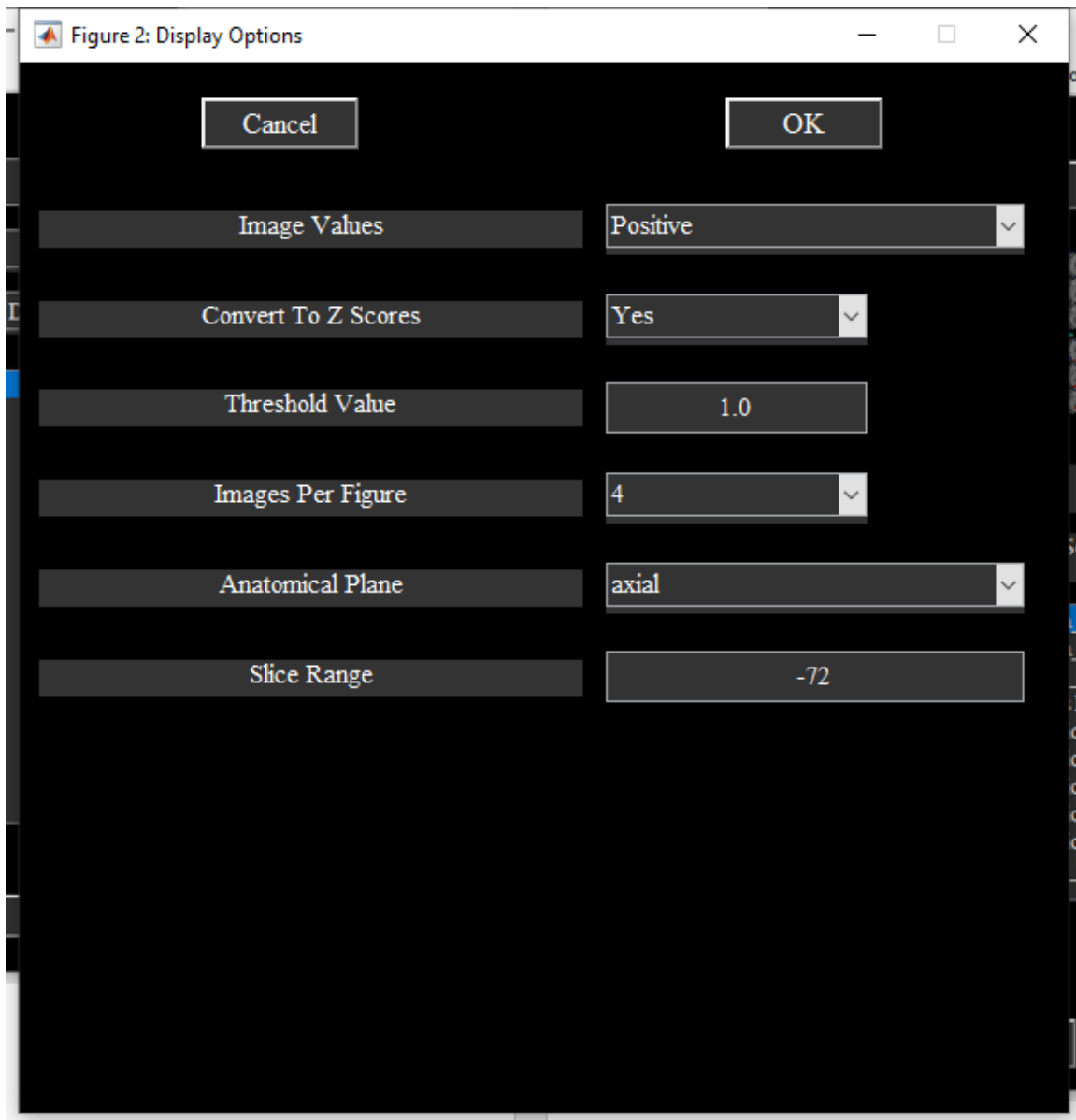
8. Then click 'Display GUI', this should appear, and you can change folders from the left side and choose file from right side



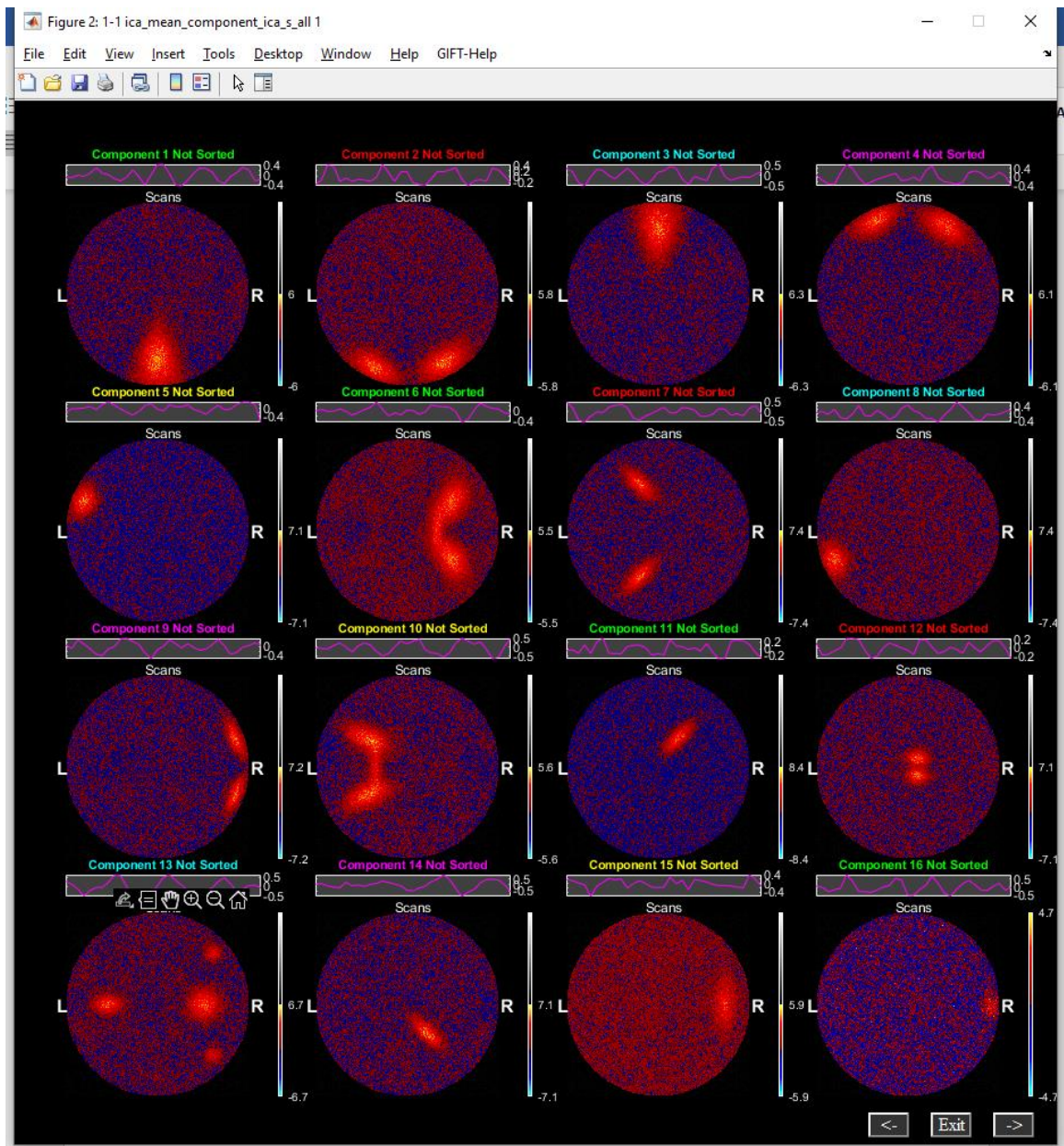
9. Click 'OK'. This would be shown on your screen.



10. Now before you hit 'Display' at the bottom right, click 'Display Defaults' on the top left.



11. Now change the 'Image values' to 'Positive and Negative', 'Threshold Value' to 0, 'Image Per Figure' to 16, Click 'OK'. Now click 'Display', it might take a few second then the results should be shown in form like



End of the ~~Manual~~Manual