

Data Selection Panel

Name of Image Matrix

Name of Variable Matrix

This tutorial contains navigation buttons that enable you to move throughout the tutorial.
Please use the navigation buttons and not the page up/page down or arrow keys to navigate through the tutorials.

This is the 'Next' button. It takes you to the next frame or stop point.



This is the 'Previous' button. It takes you to the previous frame or stop point.



This is the 'Go to frame' button. It takes you to a specified frame.



This is the 'Go to URL' button. It takes you to a website link.



Press the 'Next' button below to start this tutorial.





Data Selection Panel

Name of Image Matrix









Name of Variable Matrix

This tutorial will cover how to use the Auto ROI Extractor. The Auto ROI Extractor allows the user to extract region of interest data from a series of images using ROI masks that are created from PCA score images. This tool was created based on the observation that the positive and negative score images from PCA often are able to separate different regions of interest from a given set of samples. Typically it is the same set of score images that separate the different areas of interest for a given sample type.

At this time the PCA pre-processing is fixed and includes normalization to the total counts, Poisson scaling and mean centering. In the future I may add options to choose different pre-processing, but this method has been found to be useful for defining ROI masks for a wide range of samples.

Search of bromimages

Name ^	Date modified	Type	Size
 3T3_FAfired_1week_air_1_01_2.BIF6	12/11/2015 11:12 AM	BIF6 File	10,62
 3T3_FAfired_1week_air_3_01_1.BIF6	12/11/2015 11:13 AM	BIF6 File	10,62
 3T3_FAfired_2weeks_air_1_01_1.BIF6	12/11/2015 11:13 AM	BIF6 File	10,62
 3T3_FAfired_2weeks_air_3_04_1.BIF6	12/11/2015 11:13 AM	BIF6 File	10,62
 3T3_FAfired_4weeks_Air_1_01_2.BIF6	12/11/2015 11:14 AM	BIF6 File	10,62
 3T3_FAfired_4weeks_Air_1_05_1.BIF6	12/11/2015 11:14 AM	BIF6 File	10,62
 3T3_FAfired_fresh_1_02_2.BIF6	12/11/2015 11:09 AM	BIF6 File	10,62
 3T3_FAfired_fresh_3_01_1.BIF6	12/11/2015 11:07 AM	BIF6 File	10,62

← All the .bif6 files you want to process must be located within the same directory.

No other files or folders can be in this directory.

All files must have been processed using the same peak list.

← →

- Import Data
- Normalize Data
- Crop Image
- Filter Image
- Cut Up Stage Raster
- Align images
- Extract ROI
- Auto ROI Processor**

Data Selection Panel

Name of Variable Matrix

Select Variables

From the 'Data Pre Processing' menu select 'Auto ROI Processor'

← →

Data Selection Panel

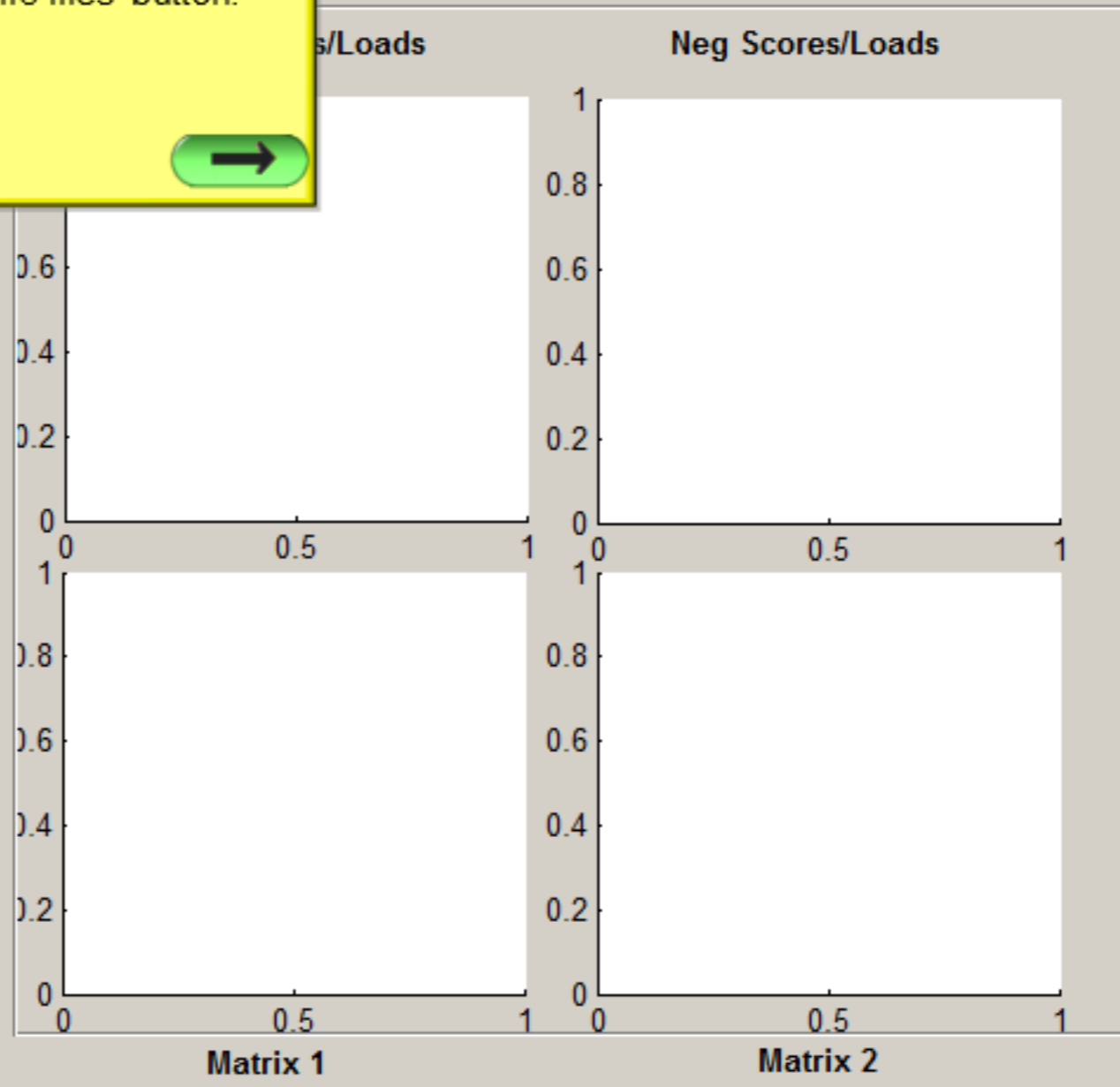
Name of Image Matrix:

Name of Variable Matrix:

Load bif6 files

Press the 'Load bif6 files' button.

File list...



- Proc All on Sel PC
- Add Pos to MAT1
- Add Pos to MAT2
- Add Neg to MAT1
- Add Neg to MAT2
- Reset Mat1
- Reset Mat2
- Close

Data Selection Panel

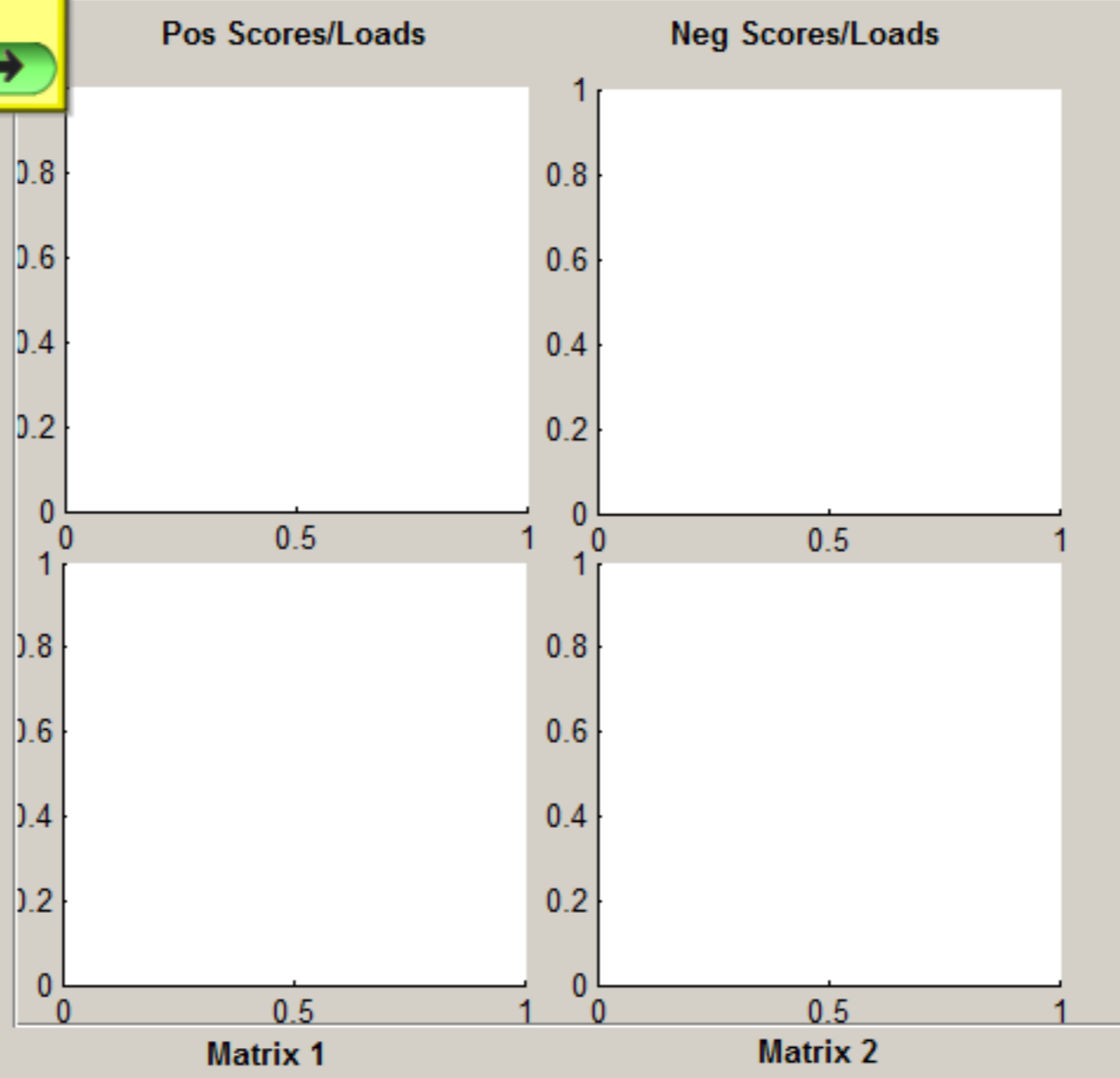
Name of Image Matrix: Name of Variable Matrix:

This process will take awhile so be patient and wait until the list box is populated.

This will take a little while. Please be patient

Load bif

File list...



- Proc All on Sel PC
- Add Pos to MAT1
- Add Pos to MAT2
- Add Neg to MAT1
- Add Neg to MAT2
- Reset Mat1
- Reset Mat2
- Close

Data Selection Panel

Name of Image Matrix:

Name of Variable Matrix:

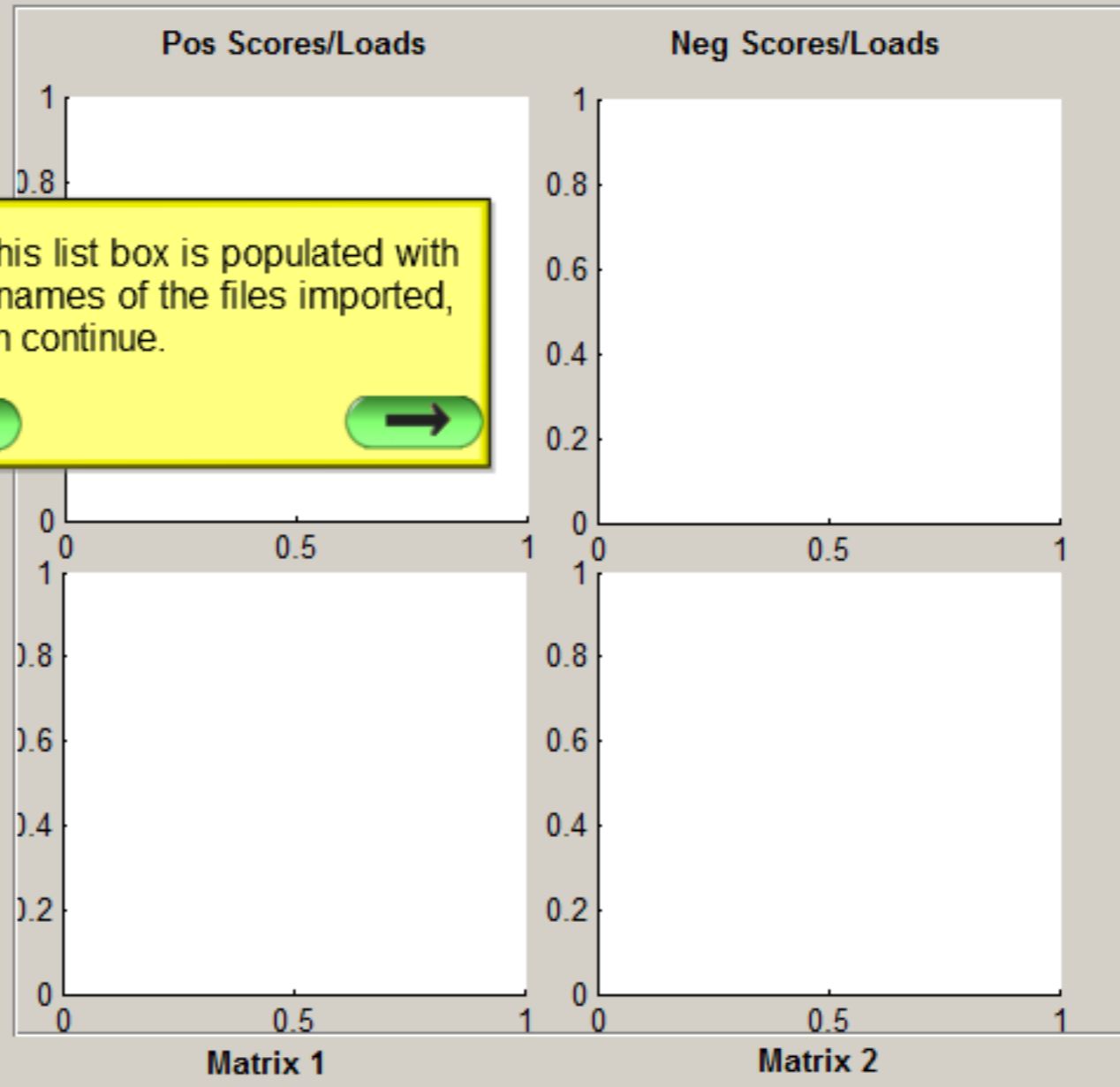
Ok. Now choose a PC number

Load bif6 files

- File List...
- 3T3_Fafixed_1week_air_1_01_2.BI
 - 3T3_Fafixed_1week_air_3_01_1.BI
 - 3T3_Fafixed_2weeks_air_1_01_1.5
 - 3T3_Fafixed_2weeks_air_3_04_1
 - 3T3_Fafixed_4weeks_Air_1_01_2
 - 3T3_Fafixed_4weeks_Air_1_05_1.E
 - 3T3_Fafixed_fresh_1_02_2.BIF6
 - 3T3_Fafixed_fresh_3_01_1.BIF6

PC #

Once this list box is populated with the filenames of the files imported, you can continue.



- Proc All on Sel PC
- Add Pos to MAT1
- Add Pos to MAT2
- Add Neg to MAT1
- Add Neg to MAT2
- Reset Mat1
- Reset Mat2
- Close

Data Selection Panel

Name of Image Matrix:

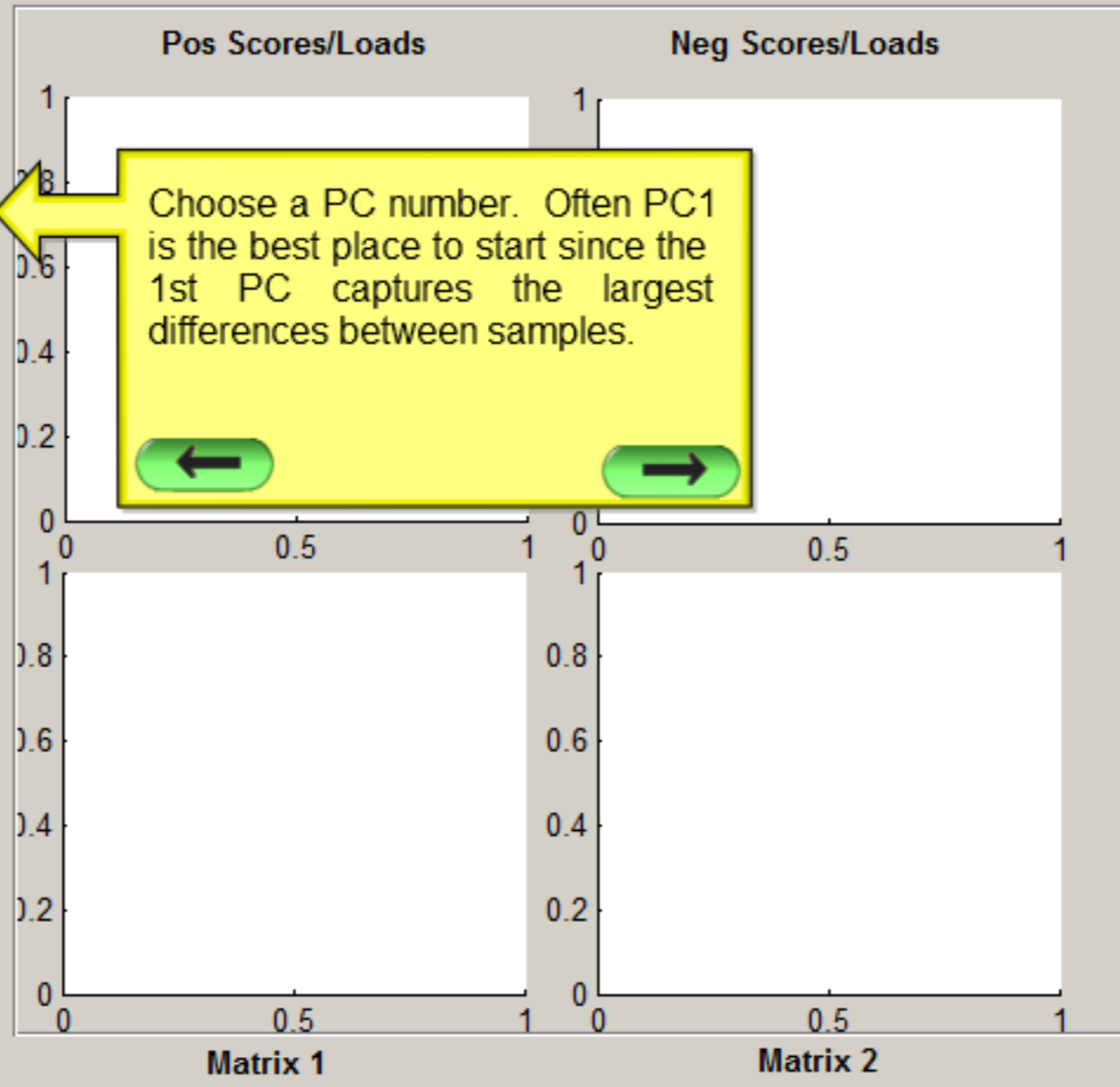
Name of Variable Matrix:

Ok. Now choose a PC number

Load bif6 files

- File List...
- 3T3_Fafixed_1week_air_1_01_2.BI
 - 3T3_Fafixed_1week_air_3_01_1.BI
 - 3T3_Fafixed_2weeks_air_1_01_1.E
 - 3T3_Fafixed_2weeks_air_3_04_1.E
 - 3T3_Fafixed_4weeks_Air_1_01_2.E
 - 3T3_Fafixed_4weeks_Air_1_05_1.E
 - 3T3_Fafixed_fresh_1_02_2.BIF6
 - 3T3_Fafixed_fresh_3_01_1.BIF6

- PC #
- 1
 - 2
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- Proc All on Sel PC
- Add Pos to MAT1
- Add Pos to MAT2
- Add Neg to MAT1
- Add Neg to MAT2
- Reset Mat1
- Reset Mat2
- Close

Data Selection Panel

Name of Image Matrix

Name of Variable Matrix

Select Data

Select Variables

Ok. Now choose a file, or choose Proc All on Sel PC

Load bif6 files

- File List...
- 3T3_FFixed_1week_air_1_01_2.R
 - 3T3_FFixed_1week_air_3_01_1.B
 - 3T3_FFixed_2weeks_air_1_01_1.E
 - 3T3_FFixed_2weeks_air_3_04_1.E
 - 3T3_FFixed_4weeks_Air_1_01_2.E
 - 3T3_FFixed_4weeks_Air_1_05_1.E
 - 3T3_FFixed_fresh_1_02_2.BIF6
 - 3T3_FFixed_fresh_3_01_1.BIF6

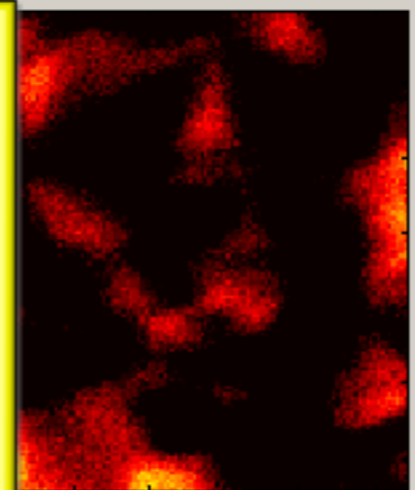
PC #

Click on a filename within the list to show the positive and negative score images.

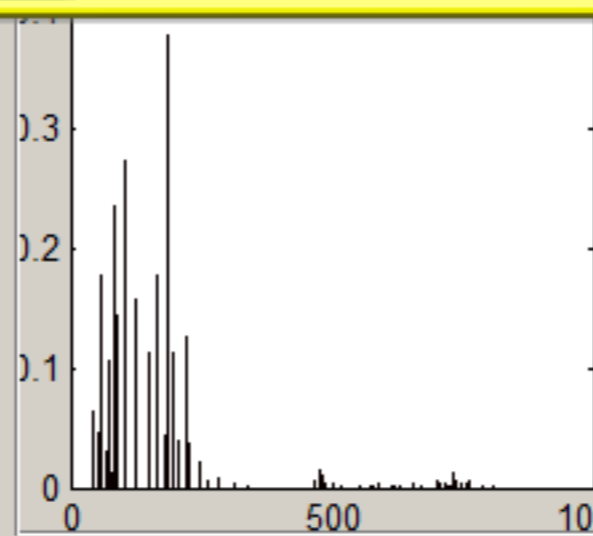
You should click on all the files to verify that the selected PC is separating out the correct regions of interest for all files.

Pos Scores/Loads

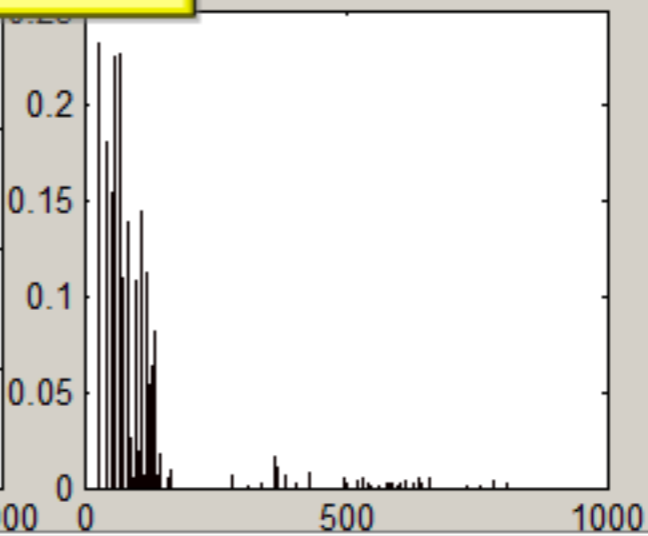
Neg Scores/Loads



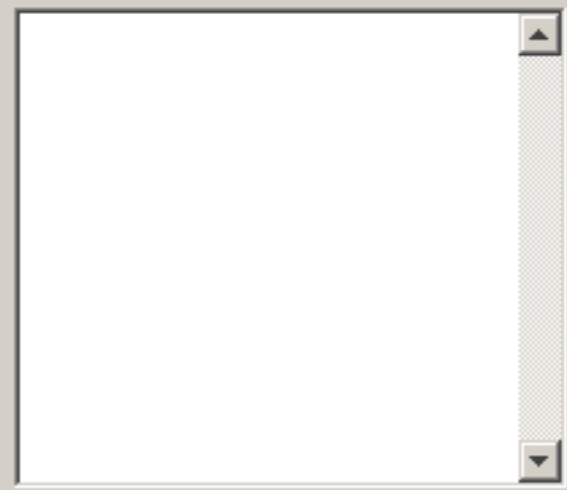
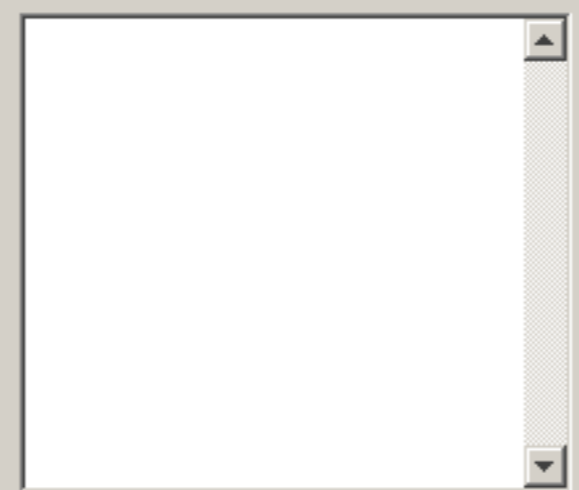
40 60 80 100 120



Matrix 1



Matrix 2



Proc All on Sel PC

Add Pos to MAT1

Add Pos to MAT2

Add Neg to MAT1

Add Neg to MAT2

Reset Mat1

Reset Mat2

Close

Data Selection Panel

Name of Image Matrix:

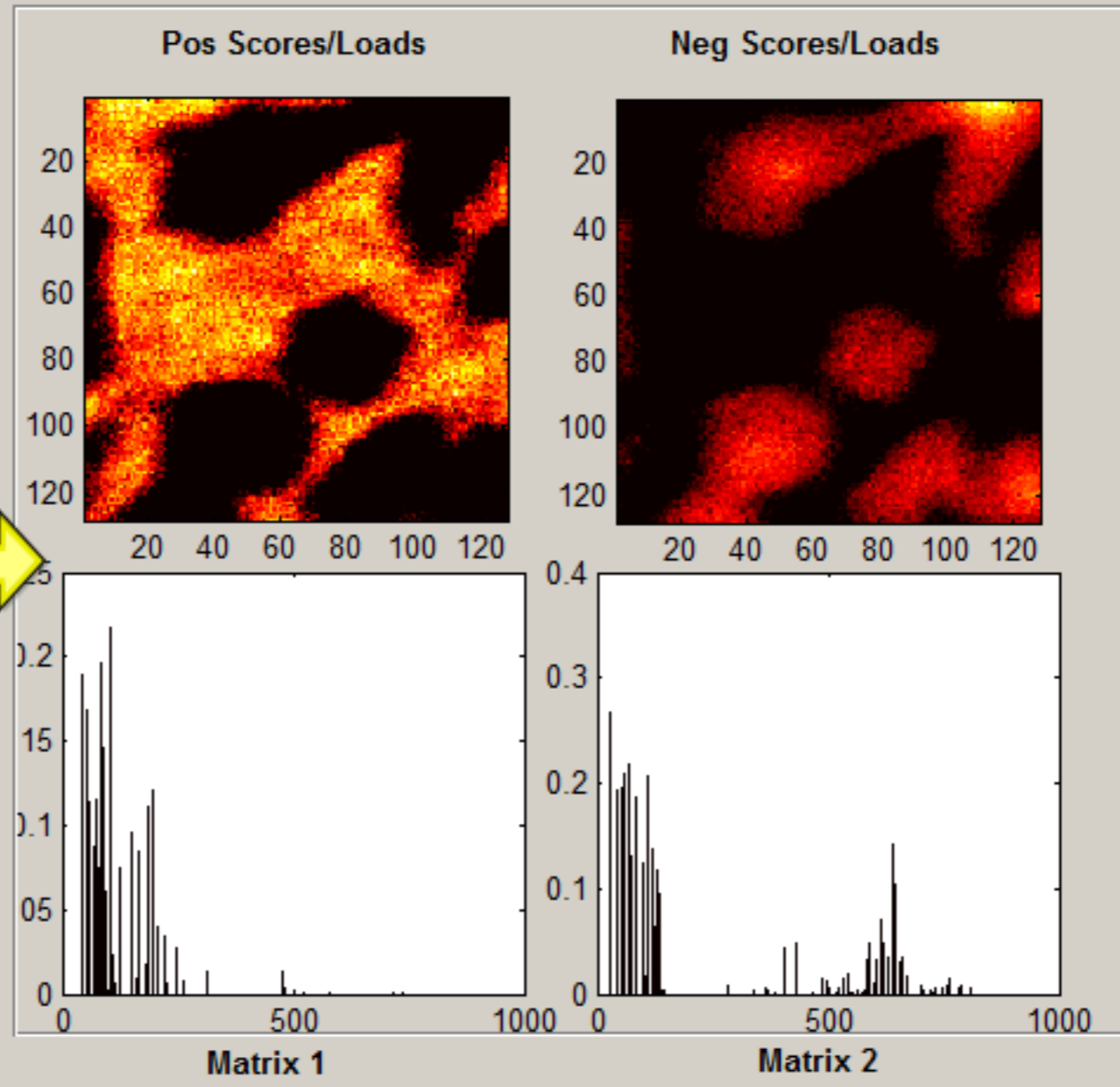
Name of Variable Matrix:

Ok. Now choose a file, or choose Proc All on Sel PC

Load bif6 files

- File List...
- 3T3_Fafixed_1week_air_1_01_2.BI
 - 3T3_Fafixed_1week_air_3_01_1.BI
 - 3T3_Fafixed_2weeks_air_1_01_1.E
 - 3T3_Fafixed_2weeks_air_3_04_1.E
 - 3T3_Fafixed_4weeks_Air_1_01_2.E
 - 3T3_Fafixed_4weeks_Air_1_05_1.E
 - 3T3_Fafixed_fresh_1_02_2.BIF6
 - 3T3_Fafixed_fresh_3_01_1.BIF6

PC #



The positive and negative ion scores and loadings are displayed here.

- Proc All on Sel PC
- Add Pos to MAT1
- Add Pos to MAT2
- Add Neg to MAT1
- Add Neg to MAT2
- Reset Mat1
- Reset Mat2
- Close

Data Selection Panel

Name of Image Matrix:

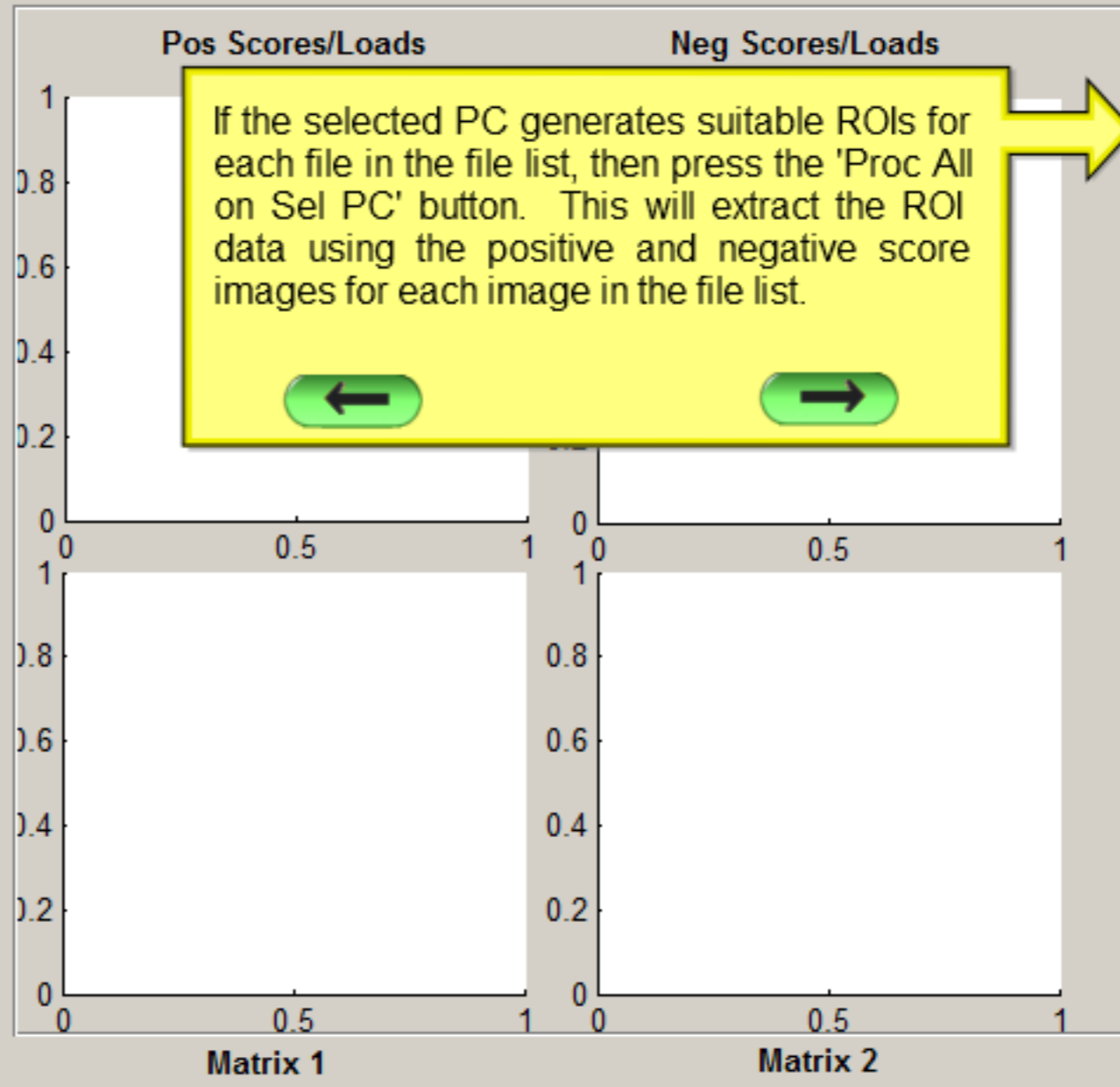
Name of Variable Matrix:

Ok. Now choose a file, or choose Proc All on Sel PC

Load bif6 files

- File List...
- 3T3_Fafixed_1week_air_1_01_2.BI
 - 3T3_Fafixed_1week_air_3_01_1.BI
 - 3T3_Fafixed_2weeks_air_1_01_1.E
 - 3T3_Fafixed_2weeks_air_3_04_1.E
 - 3T3_Fafixed_4weeks_Air_1_01_2.E
 - 3T3_Fafixed_4weeks_Air_1_05_1.E
 - 3T3_Fafixed_fresh_1_02_2.BIF6
 - 3T3_Fafixed_fresh_3_01_1.BIF6

PC #



-
-
-
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Name	Value	Min	Max
Mat1filenames	'3T3_FAfired_2weeks...		
Mat2filenames	'3T3_FAfired_2weeks...		
ROIexactmass	<164x8 char>		
ROIfilenames	<8x34 char>		
matrix1	<8x164 double>	12	1100298
matrix1TC	[29108985;23338827;...	22441...	37596...
matrix2	<8x164 double>	6	715632
matrix2TC	[20591832;17973589;...	16358...	28953...

Command Window

New to MATLAB? Watch this [Video](#), see [Demos](#), or read [Getting Started](#).

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The extracted data will be placed within the workspace.

matrix1 = data from applying positive scores ROI mask from the selected PC
 matrix 2 = data from applying negative scores ROI mask from the selected PC

matrix1TC = total counts for the data in matrix 1
 matrix2TC = total counts for the data in matrix 2

ROIexactmass = a list of the peaks in the data sets
 ROIfilenames = a list of the filenames processed

Command History

```

clear ans
clc
rcum=0.5*10^4
acirc=4*pi()*rcum^2
acirc=pi()*rcum^2
vslice=acirc*20
molpervol=C12BACmolec/vslice
volSIMS=500x500x0.002
volSIMS=500*500*0.002
C14BACmolec=6.022e23*3.04*(1e-6)/332.5955
clear;clc
imagegui
clear;clc
spectragui
clc

```


Data Selection Panel

These are the main input data that will be used in further analysis unless you specify otherwise. Use the drop down menus to select the data and information you want to use in your analysis.

Name of Data Matrix	Name of Variable Matrix	Name of Filename Matrix	Name of Totalcounts Matrix	Name of Samplenames Matrix
Select Data	Select Variables	Select Filenames	Select Totalcounts	Select Samples

Import Data From Workspace

Press the "Get Variables" button to see a list of all variables in the workspace. Then select a variable and then press the appropriate button to load it into the proper list menu in the "Data Selection Panel".

Get Variables

- Mat1filenames
- Mat2filenames
- ROlexactmass
- ROlfilenames
- matrix1
- matrix1TC
- matrix1TCb
- matrix1b
- matrix2
- matrix2TC
- matrix2TCb
- matrix2b

Raw Data

- Add to Data List
- Add to Variable List
- Add to Filename List
- Add to Totalcounts List
- Add to Samplename List

MVA Data

- Add to Scores List
- Add to Loadings List
- Add to % Variance List
- Add to Model List

At this point you can open the Spectragui and import the data matrices using the 'Import Data From Workspace' function and process it as desired.

See the Spectragui tutorials for more details on importing data and other Spectragui functions.

← →

Data Selection Panel

Name of Image Matrix

Name of Variable Matrix

Select Data

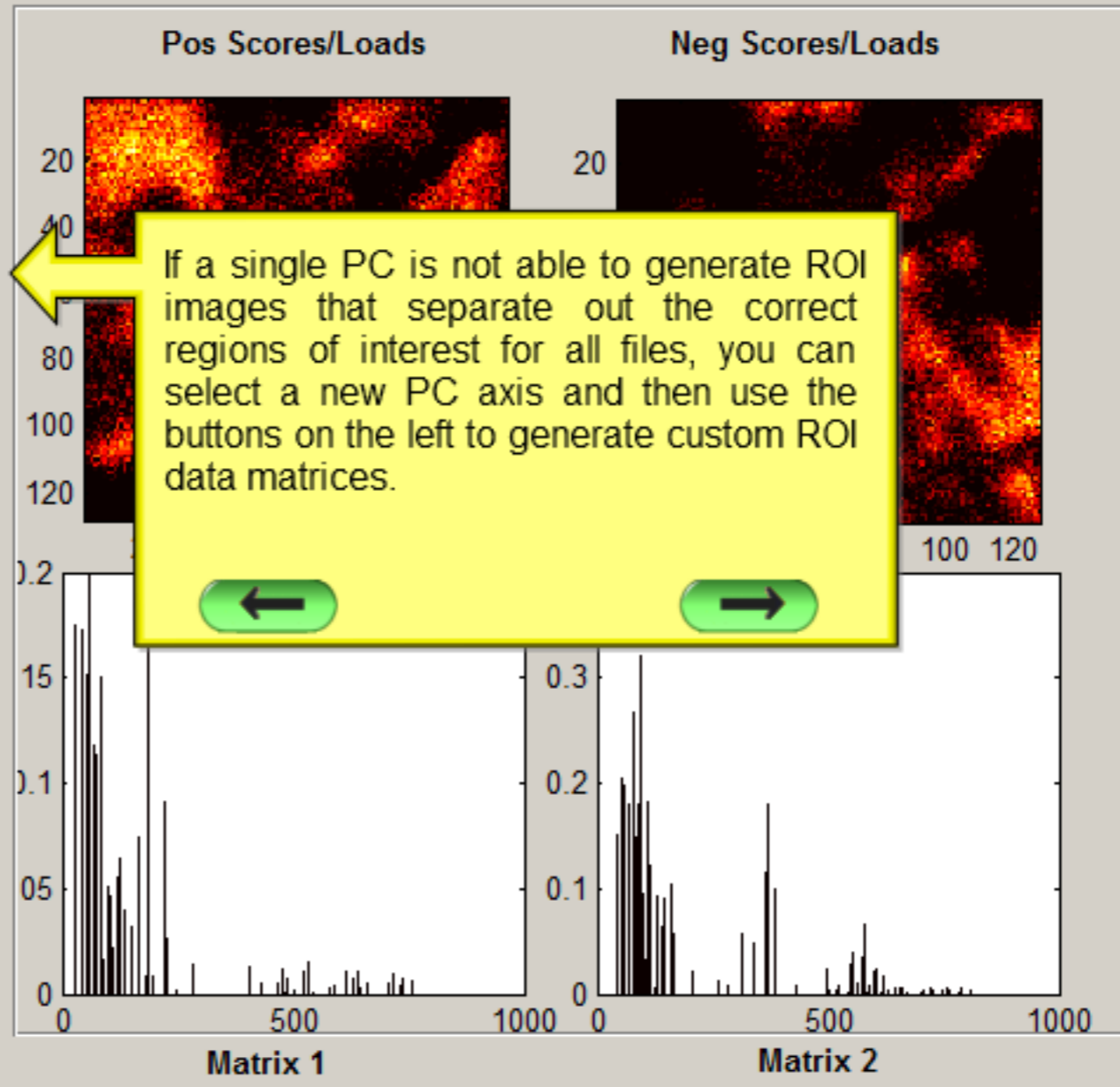
Select Variables

Ok. Now choose a file, or choose Proc All on Sel PC

Load bif6 files

- File List...
- 3T3_FAfired_1week_air_1_01_2.BI
 - 3T3_FAfired_1week_air_3_01_1.BI
 - 3T3_FAfired_2weeks_air_1_01_1.E
 - 3T3_FAfired_2weeks_air_3_04_1.E
 - 3T3_FAfired_4weeks_Air_1_01_2.E
 - 3T3_FAfired_4weeks_Air_1_05_1.E
 - 3T3_FAfired_fresh_1_02_2.BIF6
 - 3T3_FAfired_fresh_3_01_1.BIF6

- PC #
- 2
 - 1
 - 2
 - 3
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 - 18
 - 19
 - 20



Proc All on Sel PC

Add Pos to MAT1

Add Pos to MAT2

Add Neg to MAT1

Add Neg to MAT2

Reset Mat1

Reset Mat2

Close

Data Selection Panel

Name of Image Matrix:

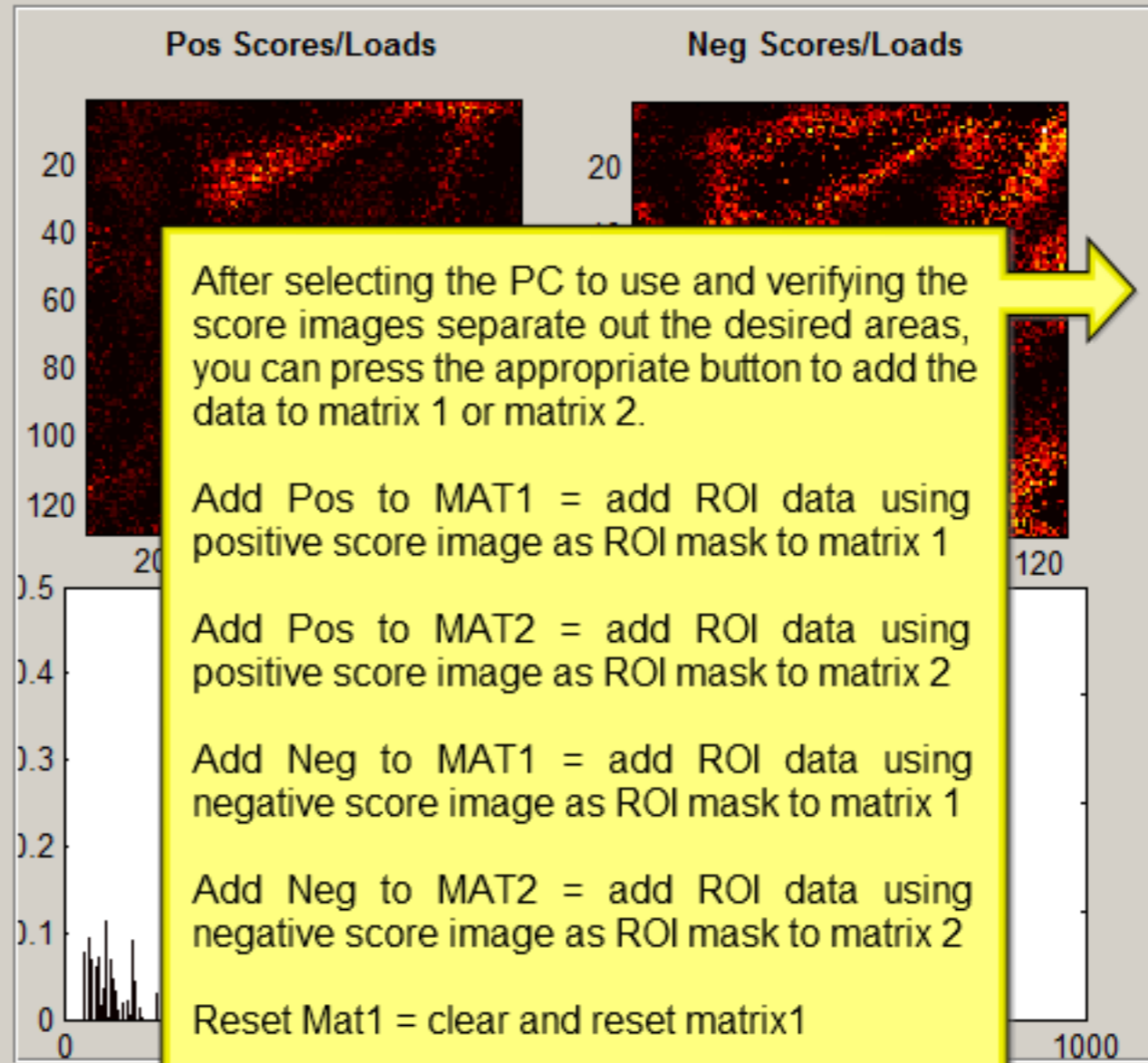
Name of Variable Matrix:

Ok. Now choose a file, or choose Proc All on Sel PC

Load bif6 files

- File List...
- 3T3_Fafixed_1week_air_1_01_2.BI
 - 3T3_Fafixed_1week_air_3_01_1.BI
 - 3T3_Fafixed_2weeks_air_1_01_1.E
 - 3T3_Fafixed_2weeks_air_3_04_1.E
 - 3T3_Fafixed_4weeks_Air_1_01_2.E
 - 3T3_Fafixed_4weeks_Air_1_05_1.E
 - 3T3_Fafixed_fresh_1_02_2.BIF6
 - 3T3_Fafixed_fresh_3_01_1.BIF6

PC #



After selecting the PC to use and verifying the score images separate out the desired areas, you can press the appropriate button to add the data to matrix 1 or matrix 2.

Add Pos to MAT1 = add ROI data using positive score image as ROI mask to matrix 1

Add Pos to MAT2 = add ROI data using positive score image as ROI mask to matrix 2

Add Neg to MAT1 = add ROI data using negative score image as ROI mask to matrix 1

Add Neg to MAT2 = add ROI data using negative score image as ROI mask to matrix 2

Reset Mat1 = clear and reset matrix1

Reset Mat2 = clear and reset matrix2

NOTE: When extracting data manually using these buttons the program creates a separate set of matrices within the workspace with a 'b' at the end of the names.

- Proc All on Sel PC
- Add Pos to MAT1
- Add Pos to MAT2
- Add Neg to MAT1
- Add Neg to MAT2
- Reset Mat1
- Reset Mat2
- Close



Workspace

Stack: No valid plots for: matrix1TC...

Name	Value	Min	Max
Mat1filenames	'3T3_FAfixed_2weeks...		
Mat2filenames	'3T3_FAfixed_2weeks...		
ROIexactmass	<164x8 char>		
ROIfilenames	<8x34 char>		
matrix1	<8x164 double>	12	1100298
matrix1TC	[29108985;23338827;...	22441...	37596...
matrix1TCb	23551100	23551...	23551...
matrix1b	<1x164 double>	32	674419
matrix2	<8x164 double>	6	715632
matrix2TC	[20591832;17973589;...	16358...	28953...
matrix2TCb	25160685	25160...	25160...
matrix2b	<1x164 double>	36	725704

Command Window

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When manually extracting data using ROIs separate data matrices are created that have a 'b' at the end. This is done to avoid overwriting the matrix1 and matrix2 data created using the 'Proc All on Sel PC' button.

Command History

```
clear ans
clc
rcum=0.5*10^4
acirc=4*pi()*rcum^2
acirc=pi()*rcum^2
vslice=acirc*20
molpervol=C12BACmolec/vslice
volSIMS=500x500x0.002
volSIMS=500*500*0.002
C14BACmolec=6.022e23*3.04*(1e-6)/332.5955
clear;clc
imagegui
clear;clc
spectragui
clc
```


Data Selection Panel

Name of Image Matrix:

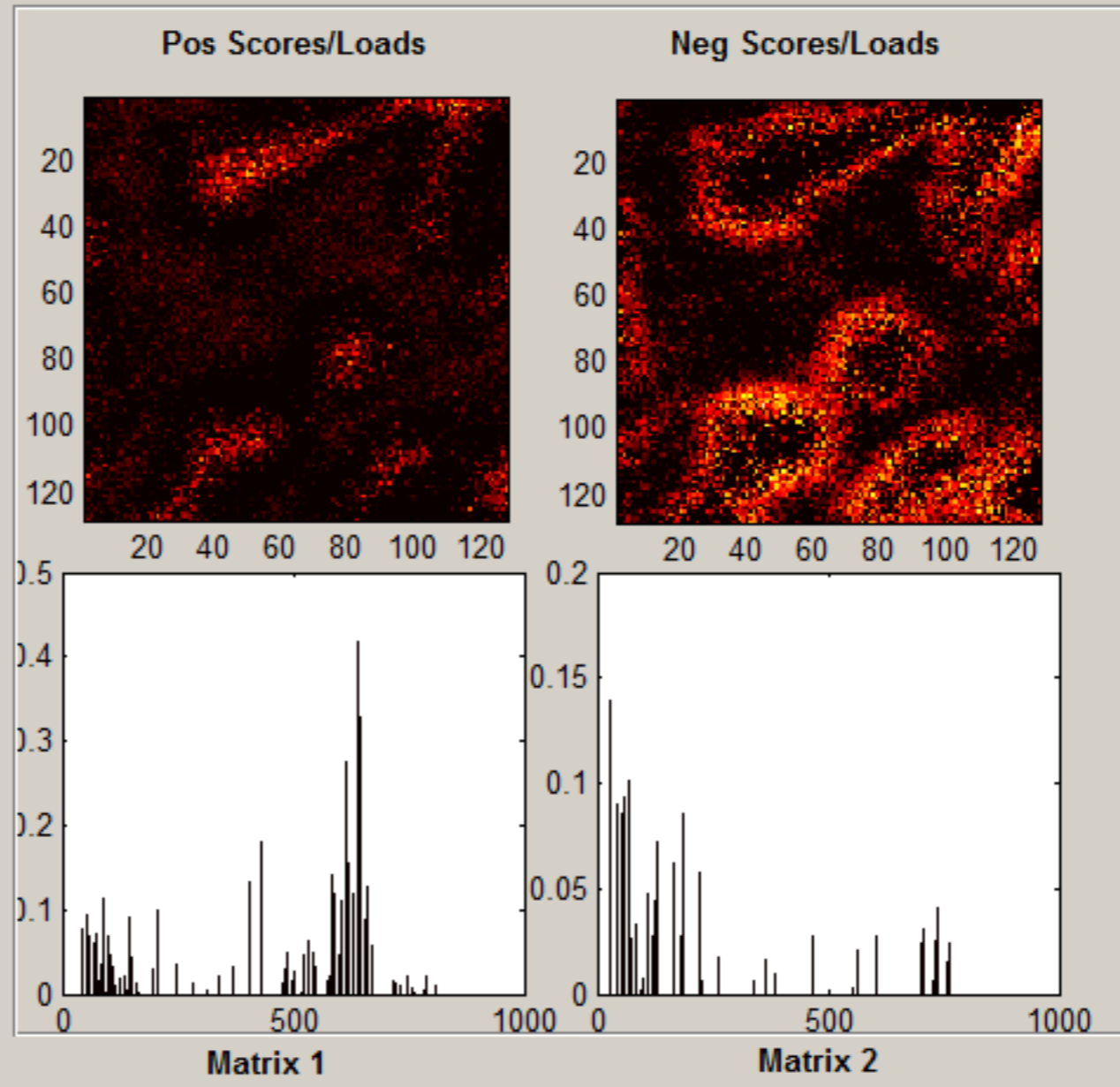
Name of Variable Matrix:

Ok. Now choose a file, or choose Proc All on Sel PC

Load bif6 files

- File List...
- 3T3_FAfired_1week_air_1_01_2.BI
 - 3T3_FAfired_1week_air_3_01_1.BI
 - 3T3_FAfired_2weeks_air_1_01_1.E
 - 3T3_FAfired_2weeks_air_3_04_1.E
 - 3T3_FAfired_4weeks_Air_1_01_2.E
 - 3T3_FAfired_4weeks_Air_1_05_1.E
 - 3T3_FAfired_fresh_1_02_2.BIF6
 - 3T3_FAfired_fresh_3_01_1.BIF6

PC #



- Proc All on Sel PC
- Add Pos to MAT1
- Add Pos to MAT2
- Add Neg to MAT1
- Add Neg to MAT2
- Reset Mat1
- Reset Mat2
- Close

- 3T3_FAfired_2weeks_air_1_01_1.E

The filenames included in Matrix 1 are shown here.

Data Selection Panel

Name of Image Matrix

Name of Variable Matrix

Select Data

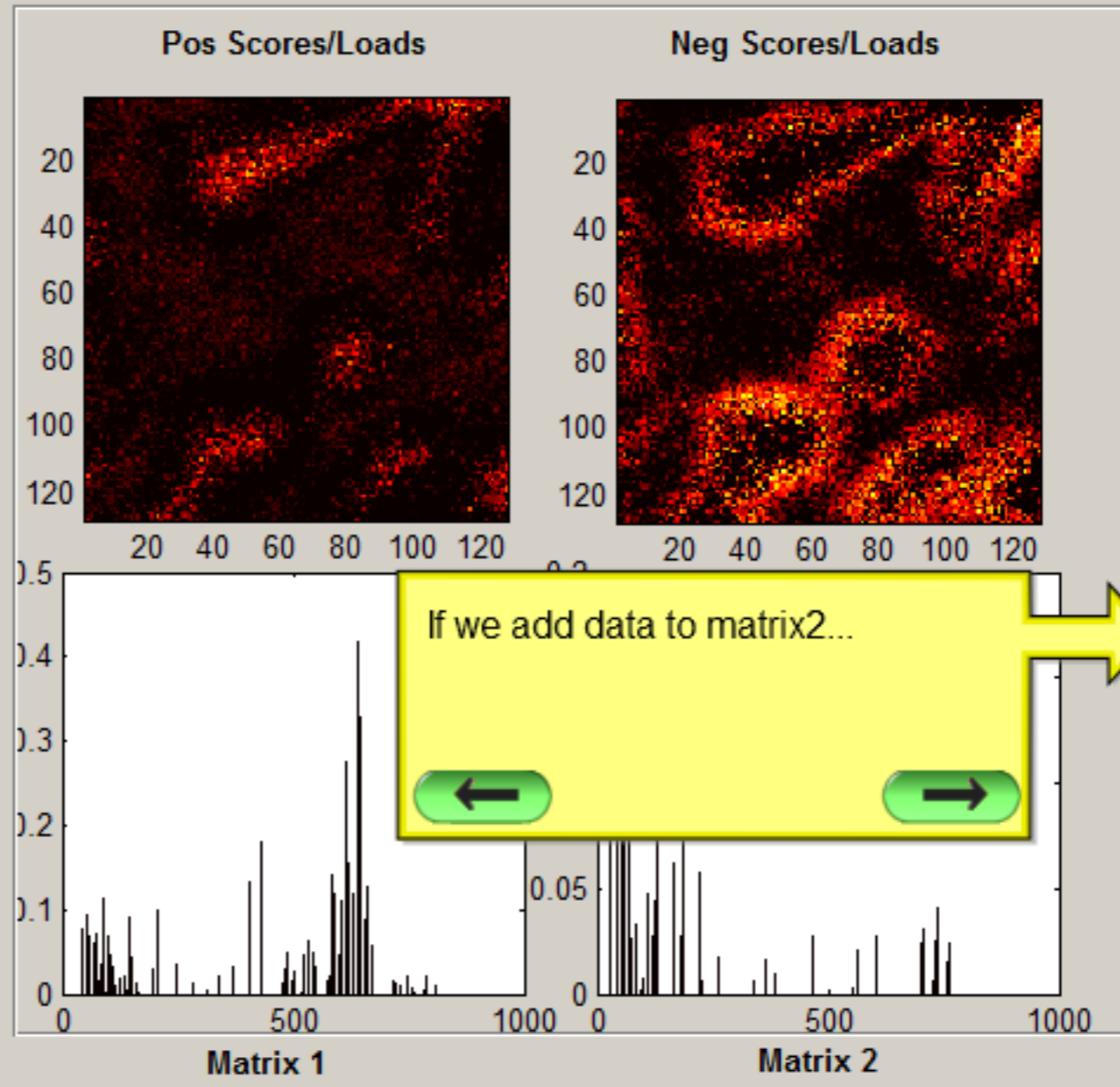
Select Variables

Ok. Now choose a file, or choose Proc All on Sel PC

Load bif6 files

- File List...
- 3T3_FAfired_1week_air_1_01_2.BI
 - 3T3_FAfired_1week_air_3_01_1.BI
 - 3T3_FAfired_2weeks_air_1_01_1.E
 - 3T3_FAfired_2weeks_air_3_04_1.E
 - 3T3_FAfired_4weeks_Air_1_01_2.E
 - 3T3_FAfired_4weeks_Air_1_05_1.E
 - 3T3_FAfired_fresh_1_02_2.BIF6
 - 3T3_FAfired_fresh_3_01_1.BIF6

PC #
2



Proc All on Sel PC

Add Pos to MAT1

Add Pos to MAT2

Add Neg to MAT1

Add Neg to MAT2

Reset Mat1

Reset Mat2

Close

3T3 FAfired 2weeks air 1 0

Data Selection Panel

Name of Image Matrix:

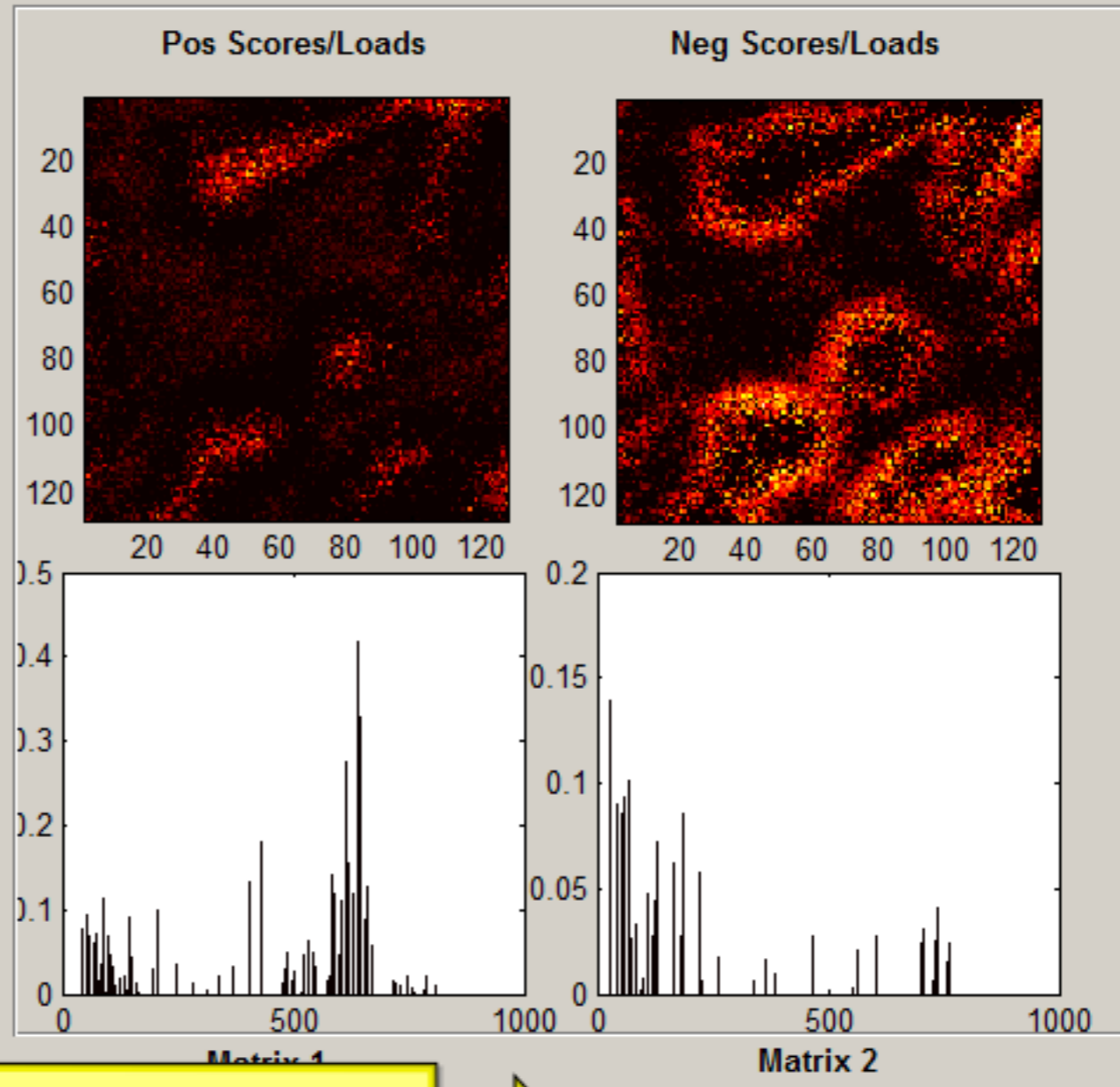
Name of Variable Matrix:

Ok. Now choose a file, or choose Proc All on Sel PC

Load bif6 files

- File List...
- 3T3_Fafixed_1week_air_1_01_2.BI
 - 3T3_Fafixed_1week_air_3_01_1.BI
 - 3T3_Fafixed_2weeks_air_1_01_1.E
 - 3T3_Fafixed_2weeks_air_3_04_1.E
 - 3T3_Fafixed_4weeks_Air_1_01_2.E
 - 3T3_Fafixed_4weeks_Air_1_05_1.E
 - 3T3_Fafixed_fresh_1_02_2.BIF6
 - 3T3_Fafixed_fresh_3_01_1.BIF6

PC #



- Proc All on Sel PC
- Add Pos to MAT1
- Add Pos to MAT2
- Add Neg to MAT1
- Add Neg to MAT2
- Reset Mat1
- Reset Mat2
- Close

The filenames are listed here.

- 3T3_Fafixed_2weeks_air_1_01_1.E

Data Selection Panel

Name of Image Matrix:

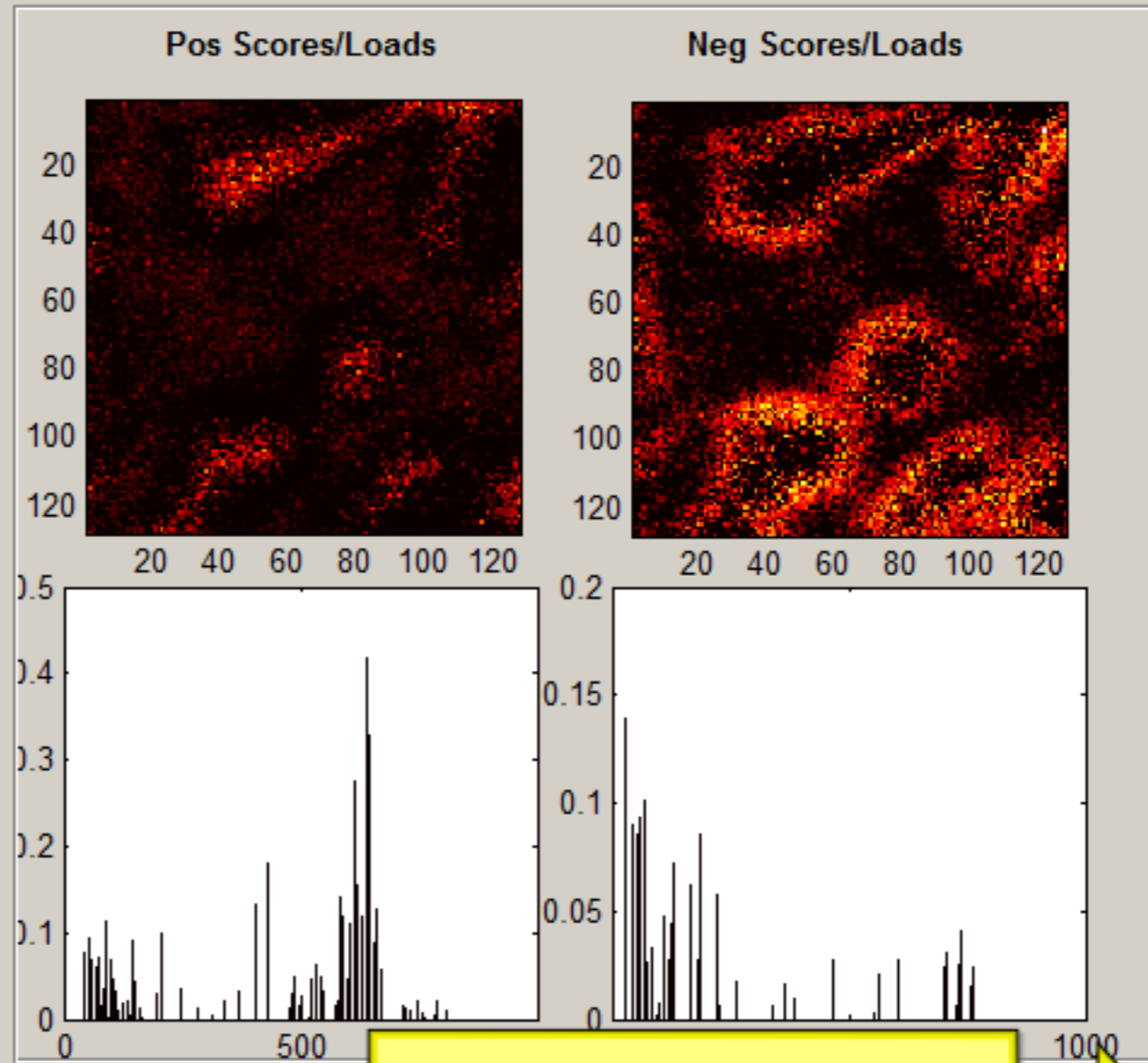
Name of Variable Matrix:

Ok. Now choose a file, or choose Proc All on Sel PC

Load bif6 files

- File List...
- 3T3_Fafixed_1week_air_1_01_2.BI
 - 3T3_Fafixed_1week_air_3_01_1.BI
 - 3T3_Fafixed_2weeks_air_1_01_1.E
 - 3T3_Fafixed_2weeks_air_3_04_1.E
 - 3T3_Fafixed_4weeks_Air_1_01_2.E
 - 3T3_Fafixed_4weeks_Air_1_05_1.E
 - 3T3_Fafixed_fresh_1_02_2.BIF6
 - 3T3_Fafixed_fresh_3_01_1.BIF6

PC #



- Proc All on Sel PC
- Add Pos to MAT1
- Add Pos to MAT2
- Add Neg to MAT1
- Add Neg to MAT2
- Reset Mat1
- Reset Mat2
- Close

When you are done, you can close the panel by pressing the 'Close' button.

Matrix 1

3T3_Fafixed_2weeks

Data Selection Panel

Name of Image Matrix:

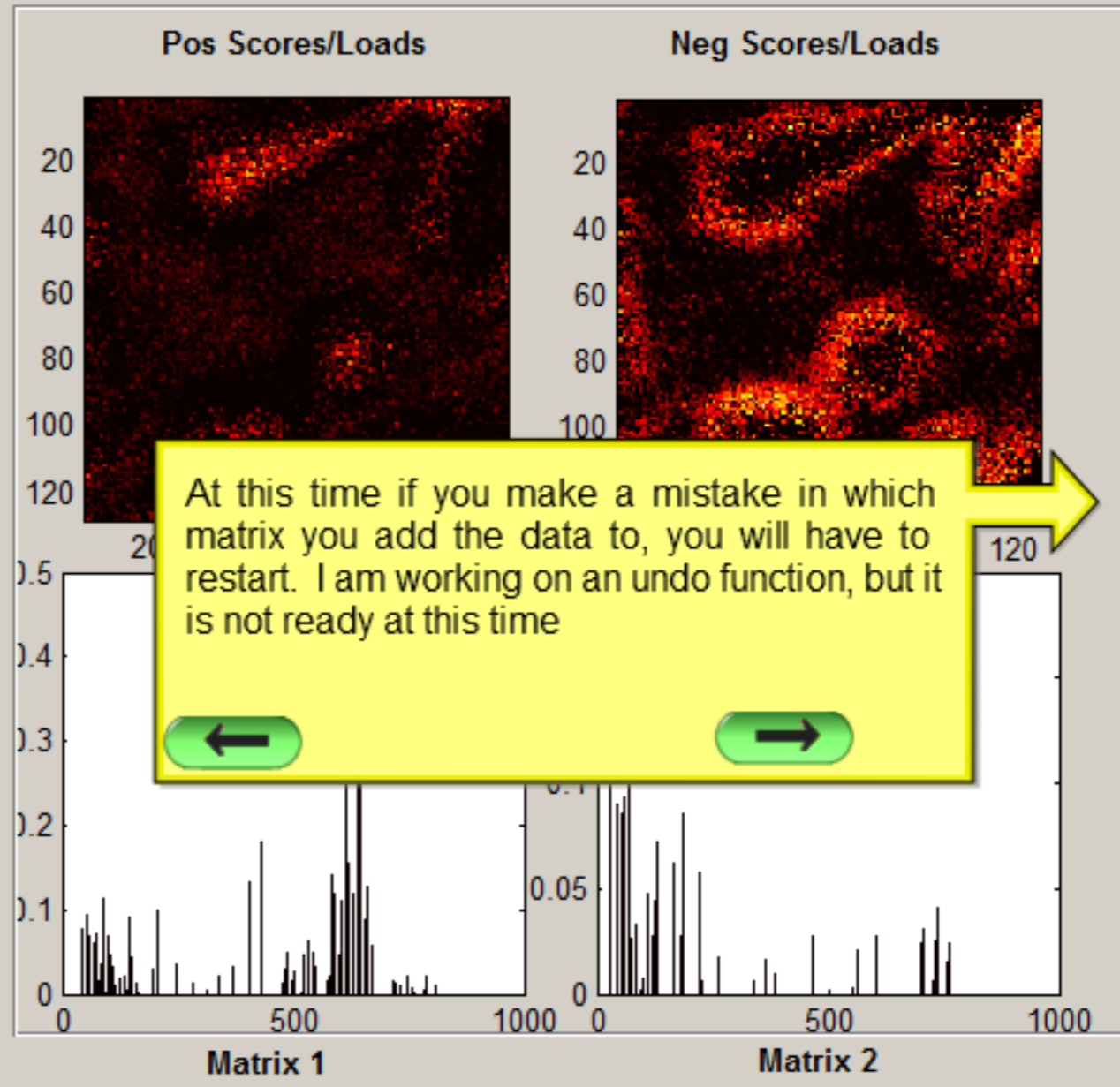
Name of Variable Matrix:

Ok. Now choose a file, or choose Proc All on Sel PC

Load bif6 files

- File List...
- 3T3_FAfired_1week_air_1_01_2.BI
 - 3T3_FAfired_1week_air_3_01_1.BI
 - 3T3_FAfired_2weeks_air_1_01_1.E
 - 3T3_FAfired_2weeks_air_3_04_1.E
 - 3T3_FAfired_4weeks_Air_1_01_2.E
 - 3T3_FAfired_4weeks_Air_1_05_1.E
 - 3T3_FAfired_fresh_1_02_2.BIF6
 - 3T3_FAfired_fresh_3_01_1.BIF6

PC #



- Proc All on Sel PC
- Add Pos to MAT1
- Add Pos to MAT2
- Add Neg to MAT1
- Add Neg to MAT2
- Reset Mat1
- Reset Mat2
- Close

3T3 FAfired 2weeks air 1 0

3T3 FAfired 2weeks air 1 0

Data Selection Panel

Name of Image Matrix

Select Data

Name of Variable Matrix

Select Variables

That ends this tutorial. Press the button on the left to go back to the previous step. Press the button on the right to start the tutorial over.

Please see the other imagegui tutorials for detailed information on how to use each function in the imagegui.

