

Data Analysis

Origin Matlab

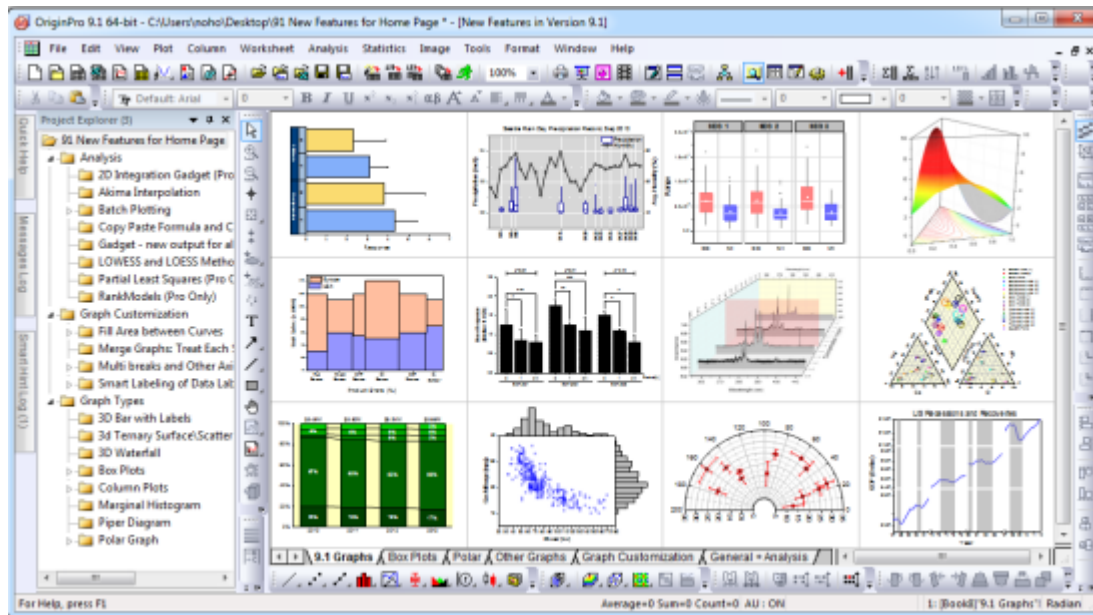
王烁

2013.10.27

Origin

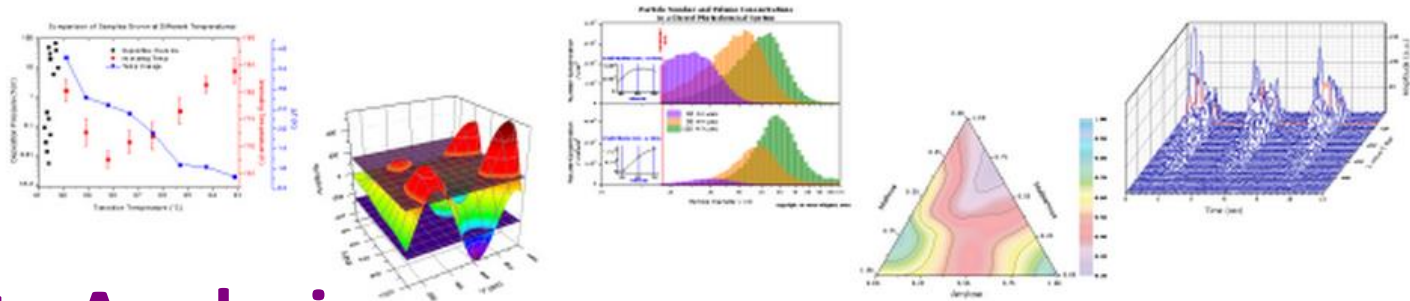
- Website <http://www.originlab.com/>
- Version 9.0 Latest 9.1
- Download

<http://pt.vm.fudan.edu.cn/index.php?topic=8282.0>

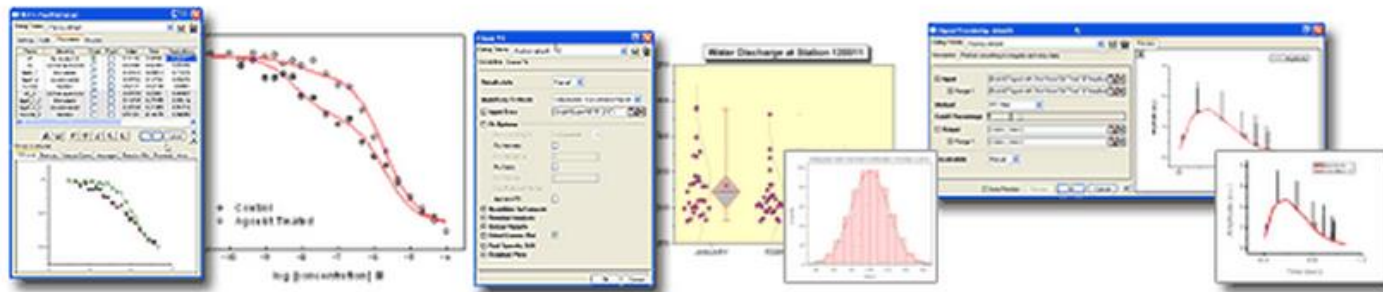


Function

- Graphing



- Data Analysis



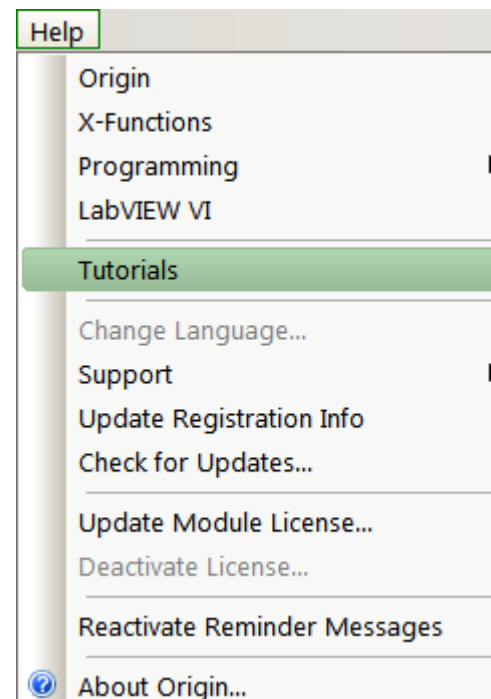
- Programming

Help

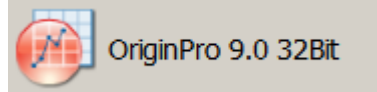
- Origin Wiki

http://wiki.originlab.com/~originla/wiki/index.php?title=Main_Page

- Origin Help
- Google
- Library



Interface



Book.ogw



Graph.ogg



Project.opj

OriginPro 9 32-bit - E:\Users\Vansure\Documents\OriginLab\90\User Files\UNTITLED * - /Folder1/

File Edit View Layout Tools Format Window Help

91%

Default: Arial

Book1

	A(X)	B(Y)
Long Name		
Units		
Comments		
1	1	2
2	2	3
3	3	4
4	4	5
5		
6		
7		
8		
9		
10		

Sheet1

Graph1

Notes

Hello!

Function1 - F

New Function Rename
Polar Rescale

1

$x_0 = 0$
 $dx = <autoX>$

Layout1

Digitizer

Digitize2 - impulse_0.bmp

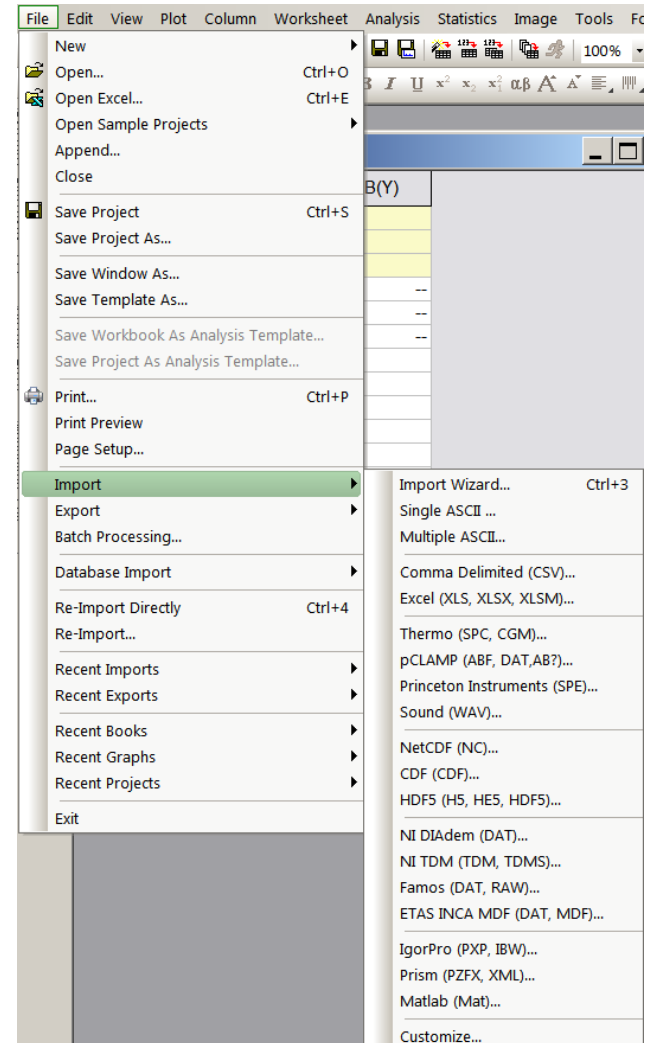
For Help, press F1

[- AU : ON Dark Colors & Light Grids [Graph1] Radian

Import

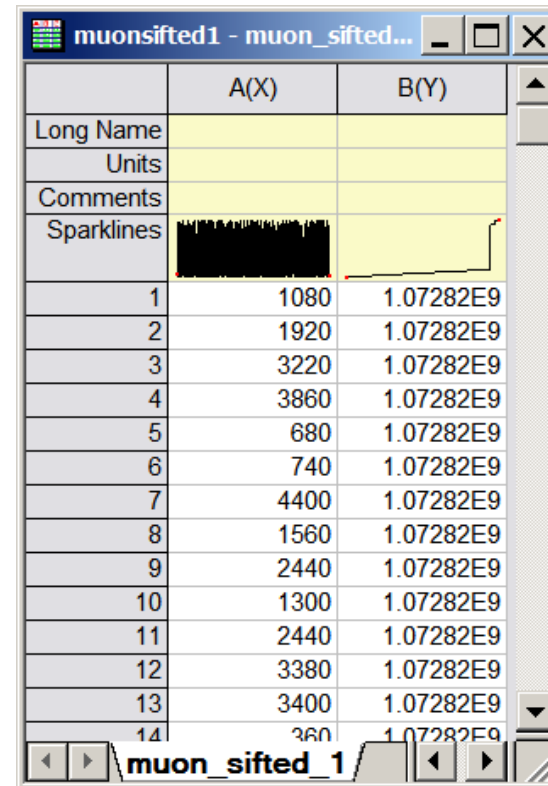
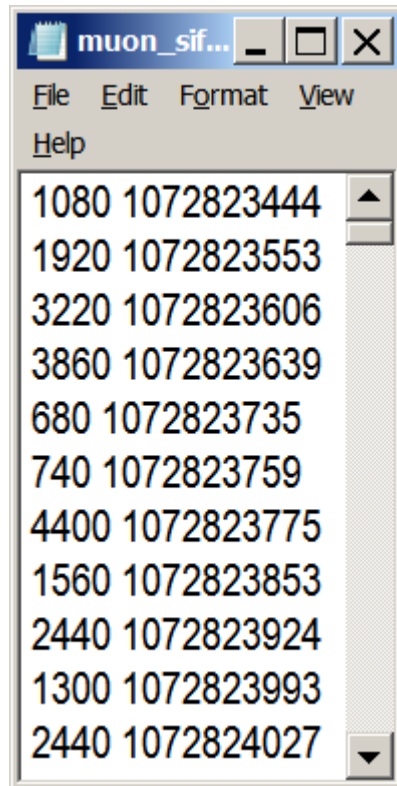
- ASCII .txt
- Excel .xls .csv
- Sound .wav
- Matlab .mat

.....



Example μ lifetime

- File: muon_sifted_1.txt




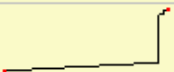
Workbook

- Set Column
- Add
- Fill
- Sort
- Transpose
- Select
- Property
- Delete
- Filter
- Statistics
- Frequency count

.....

Example Frequency Count

- File: [muon_sifted_1.txt](#)

	A(X)	B(Y)
Long Name		
Units		
Comments		
Sparklines		
1	1080	1.07282E9
2	1920	1.07282E9
3	3220	1.07282E9
4	3860	1.07282E9
5	680	1.07282E9
6	740	1.07282E9
7	4400	1.07282E9
8	1560	1.07282E9
9	2440	1.07282E9
10	1300	1.07282E9
11	2440	1.07282E9
12	3380	1.07282E9
13	3400	1.07282E9
14	360	1.07282E9

	BinCenter(X)	BinEnd(Y)	Counts(Y)	CumulCount(Y)
Long Name	Bin Center	Bin End	Count	Cumulative Count
Units				
Comments	Frequency Co	Frequency	Frequency Co	Frequency Counts of A
1	500	1000	12891	12891
2	1500	2000	8470	21361
3	2500	3000	5254	26615
4	3500	4000	3371	29986
5	4500	5000	2129	32115
6	5500	6000	1271	33386
7	6500	7000	812	34198
8	7500	8000	570	34768
9	8500	9000	347	35115
10	9500	10000	287	35402
11	10500	11000	199	35601
12	11500	12000	144	35745
13	12500	13000	115	35860
14	13500	14000	124	35984
15	14500	15000	92	36076
16	15500	16000	74	36150
17	16500	17000	84	36234
18	17500	18000	78	36312
19	18500	19000	73	36385
20	19500	20000	94	36479
21	20500	21000	0	36479
22				

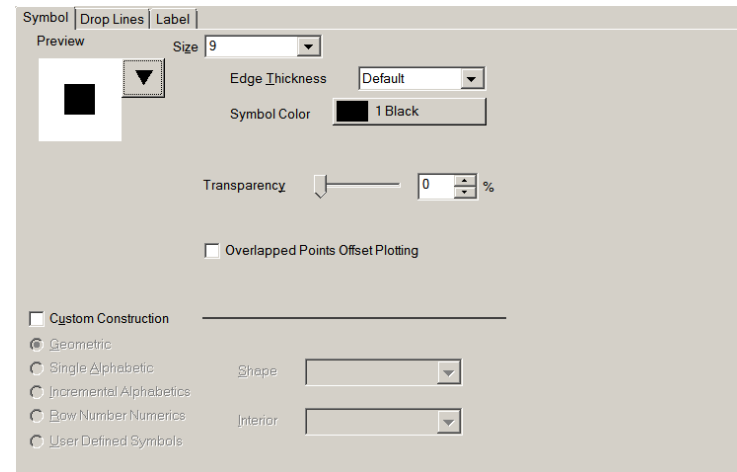
Graph

- Line & Symbol
 - Contour
 - Polar
 - Vector
 - 3D
- Scale
 - Tick Labels
 - Grid
 - Symbol
 - Line

...

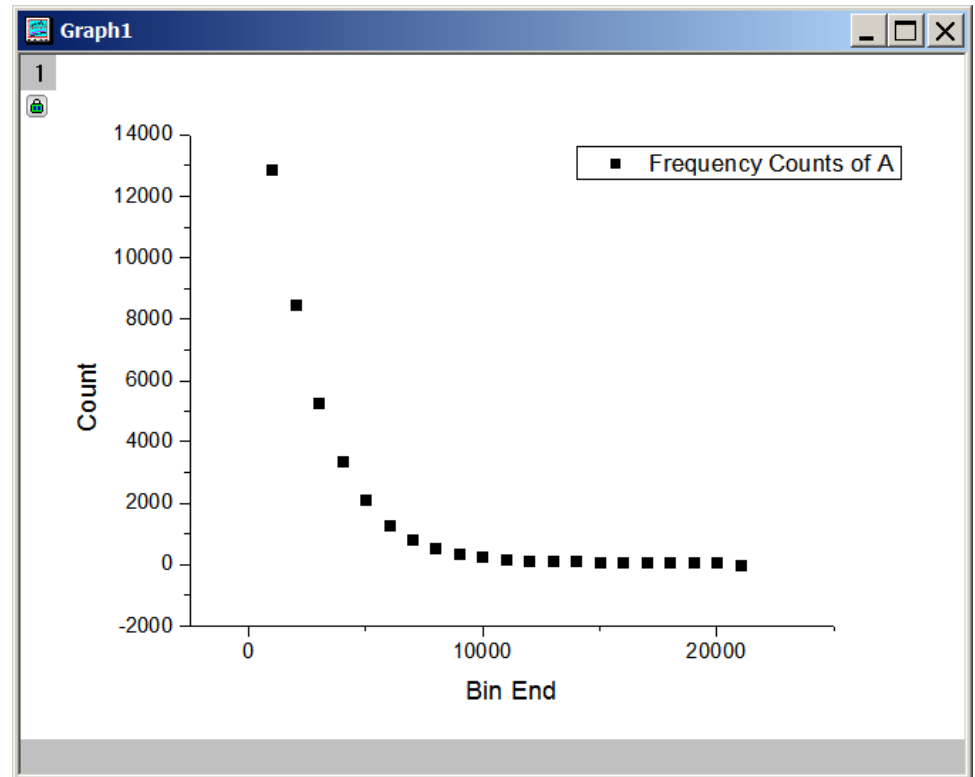


...



Example Line

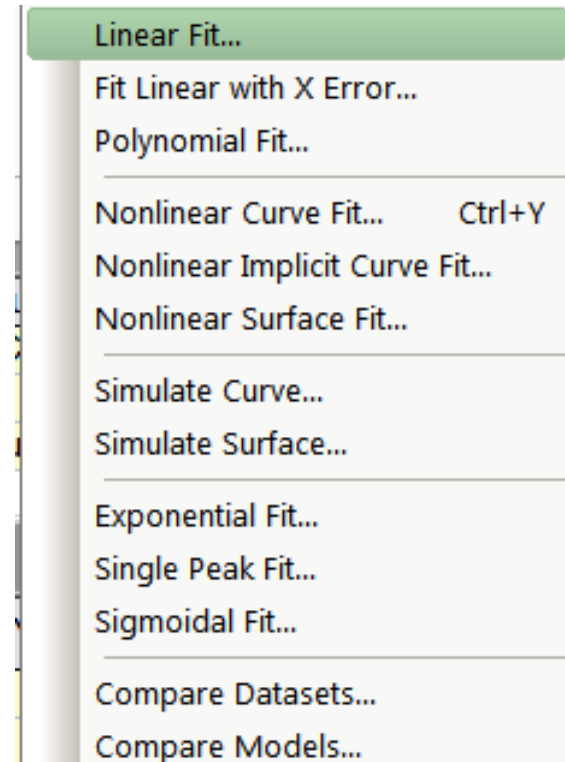
Long Name	BinCenter(Y)	BinEnd(Y)	Counts(Y)	CumulCount(Y)
Units	Bin Center	Bin End	Count	Cumulative Count
Comments	Frequency Co	Frequency	Frequency Co	Frequency Counts of A
1	500	1000	12891	12891
2	1500	2000	8470	21361
3	2500	3000	5254	26615
4	3500	4000	3371	29986
5	4500	5000	2129	32115
6	5500	6000	1271	33386
7	6500	7000	812	34198
8	7500	8000	570	34768
9	8500	9000	347	35115
10	9500	10000	287	35402
11	10500	11000	199	35601
12	11500	12000	144	35745
13	12500	13000	115	35860
14	13500	14000	124	35984
15	14500	15000	92	36076
16	15500	16000	74	36150
17	16500	17000	84	36234
18	17500	18000	78	36312
19	18500	19000	73	36385
20	19500	20000	94	36479
21	20500	21000	0	36479
22				



Fit

- Linear Fit
- Exponential Fit
- Polynomial Fit
- Explicit/Implicit
- Surface Fit

...



Example Exponential Fitting

The screenshot shows the NLFit (Lifetime (User)) dialog box. The 'Function Selection' tab is active, showing a list of functions on the left and configuration options on the right. The 'Category' is set to 'Muon', the 'Function' is 'Lifetime (User)', and the 'Iteration Algorithm' is 'Levenberg Marquardt'. The 'File Name (FDF)' is 'E:\Users\Vensure\Documents\OriginLab\90\User Files\fitfunc\Lifetime.fdf'. The bottom section shows derived parameter settings and a quick check summary.

Settings | Code | Parameters | Bounds

Function Selection

Data Selection

Fitted Curves

Find X/Y

Advanced

Output

Category: Muon

Function: Lifetime (User)

Iteration Algorithm: Levenberg Marquardt

Description

File Name (FDF): E:\Users\Vensure\Documents\OriginLab\90\User Files\fitfunc\Lifetime.fdf

Fit Done Cancel

Residual Formula Sample Curve Messages Function File Hints

[Origin C Parameter Initialization Header]

[Derived Parameter Settings]

Unit =

Names =

Meanings =

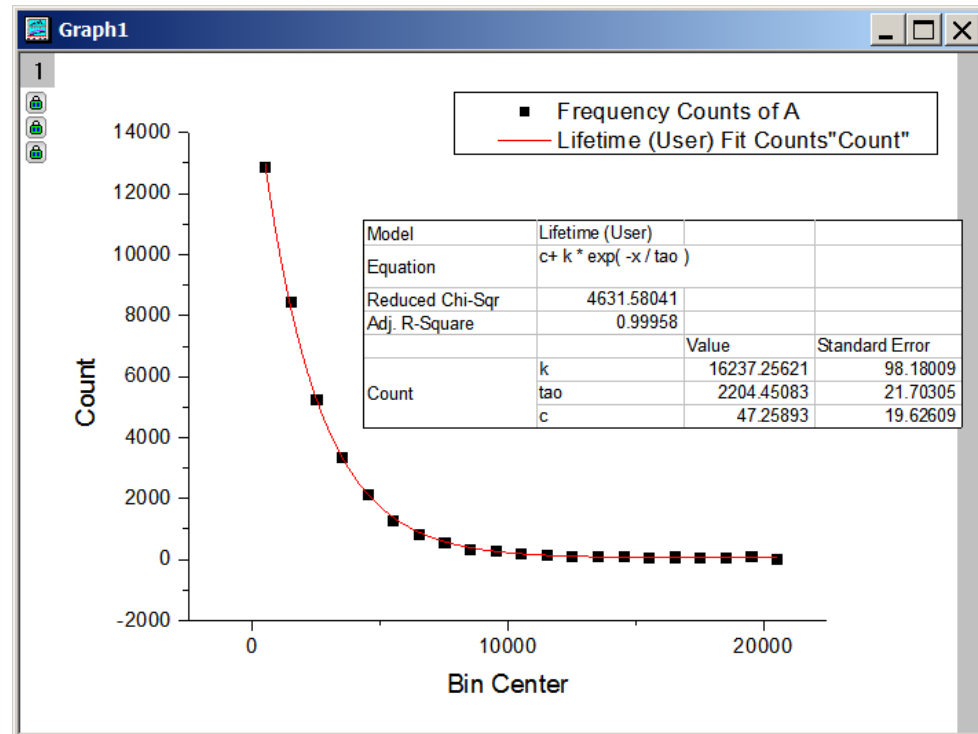
[QuickCheck]

x=1

k=16000

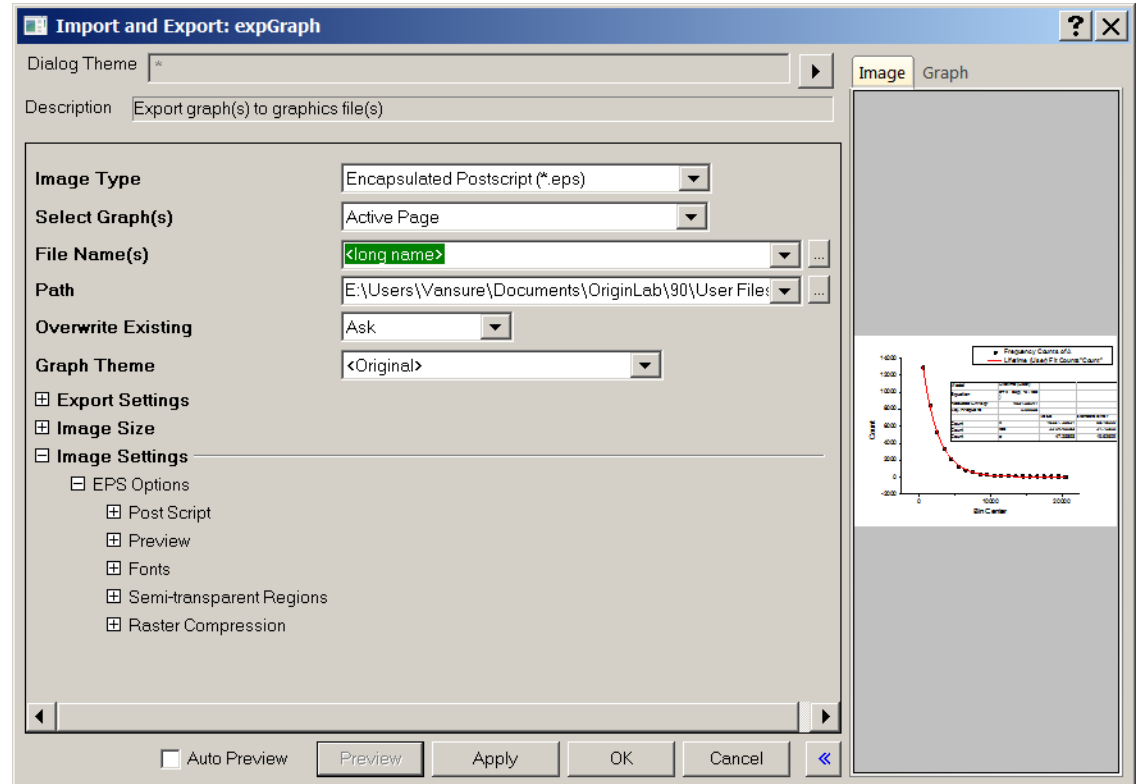
tao=2000

c=99



Export Graph

- Encapsulated Postscript (*.eps)
- Adobe Illustrator (*.ai)**
- Bitmap (*.bmp)
- Computer Graphics Metafile (*.cgm)
- AutoCAD Drawing Interchange (*.dxf)
- Enhanced MetaFile (*.emf)
- Encapsulated Postscript (*.eps)
- Graphics Interchange Format (*.gif)
- Joint Photographic Experts Group (*.jpg)
- Zsoft PC Paintbrush Bitmap (*.pcx)
- Portable Document Format (*.pdf)
- Portable Network Graphics (*.png)
- Adobe Photoshop (*.psd)
- Truevision Targa (*.tga)
- Tag Image File (*.tif)
- Windows MetaFile (*.wmf)



Matlab

- Website

www.mathworks.com/products/matlab

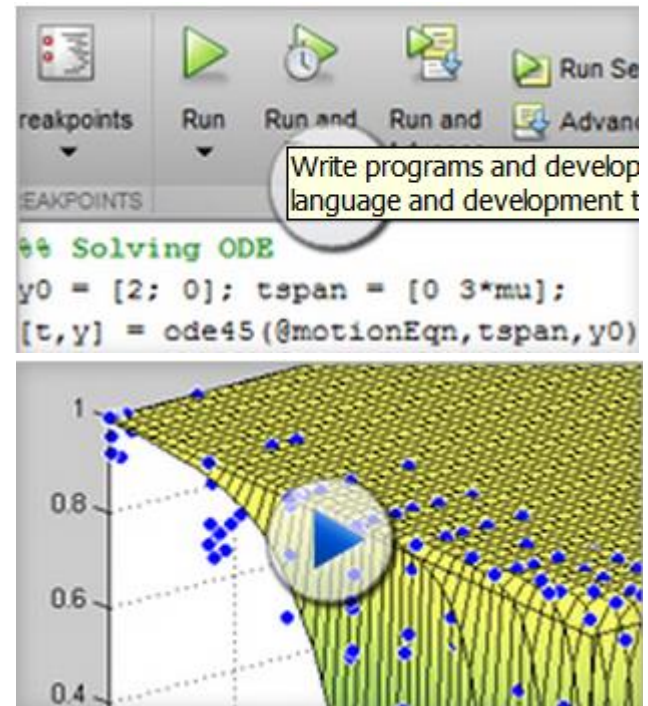
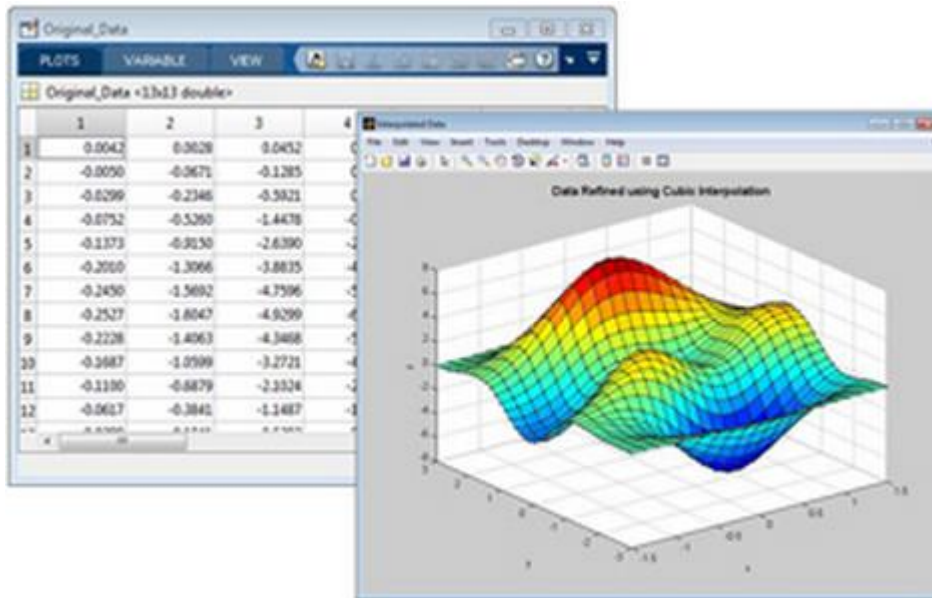
- Version R2012a Latest R2013

- Download

<http://pt.vm.fudan.edu.cn/index.php?topic=4888.0>

Function

- Numeric Computation
- Data Analysis and Visualization
- Programming and Algorithm Development
- Application Development and Deployment



Add-On Products

Add-On Products

Applications

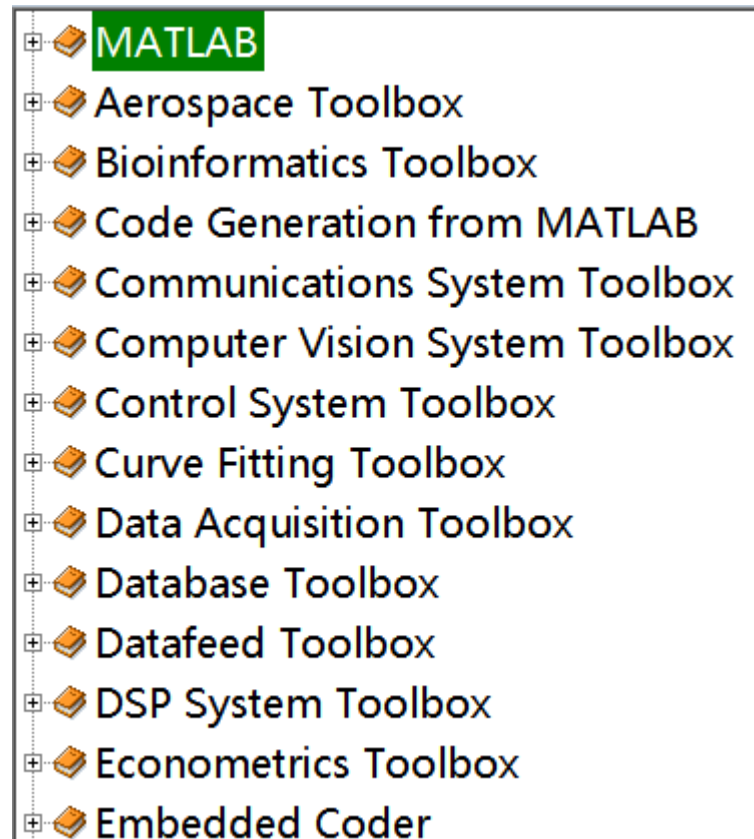
Hardware Support

MATLAB is the foundation for all products, including [Simulink®](#). You can extend MATLAB with add-on products for:

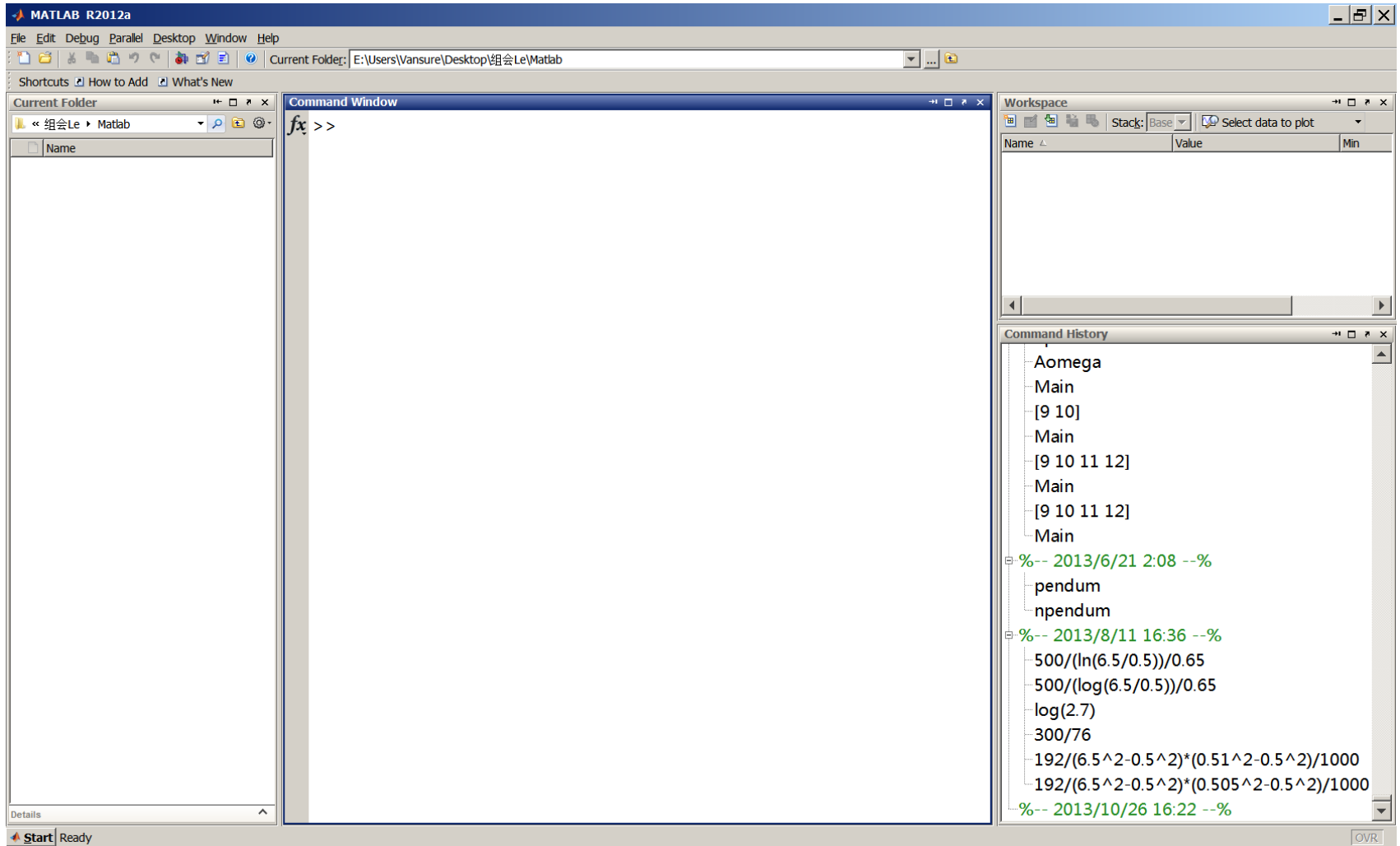
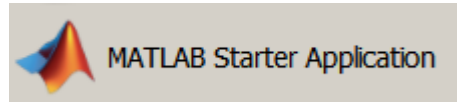
- › Parallel Computing
- › Math, Statistics, and Optimization
- › Control System Design and Analysis
- › Signal Processing and Communications
- › Image Processing and Computer Vision
- › Test and Measurement
- › Computational Finance
- › Computational Biology
- › Code Generation and Verification
- › Application Deployment
- › Database Connectivity and Reporting

Help

- Matlab Help
- Google
- BBS [iLoveMatlab](#)
- Library



Interface

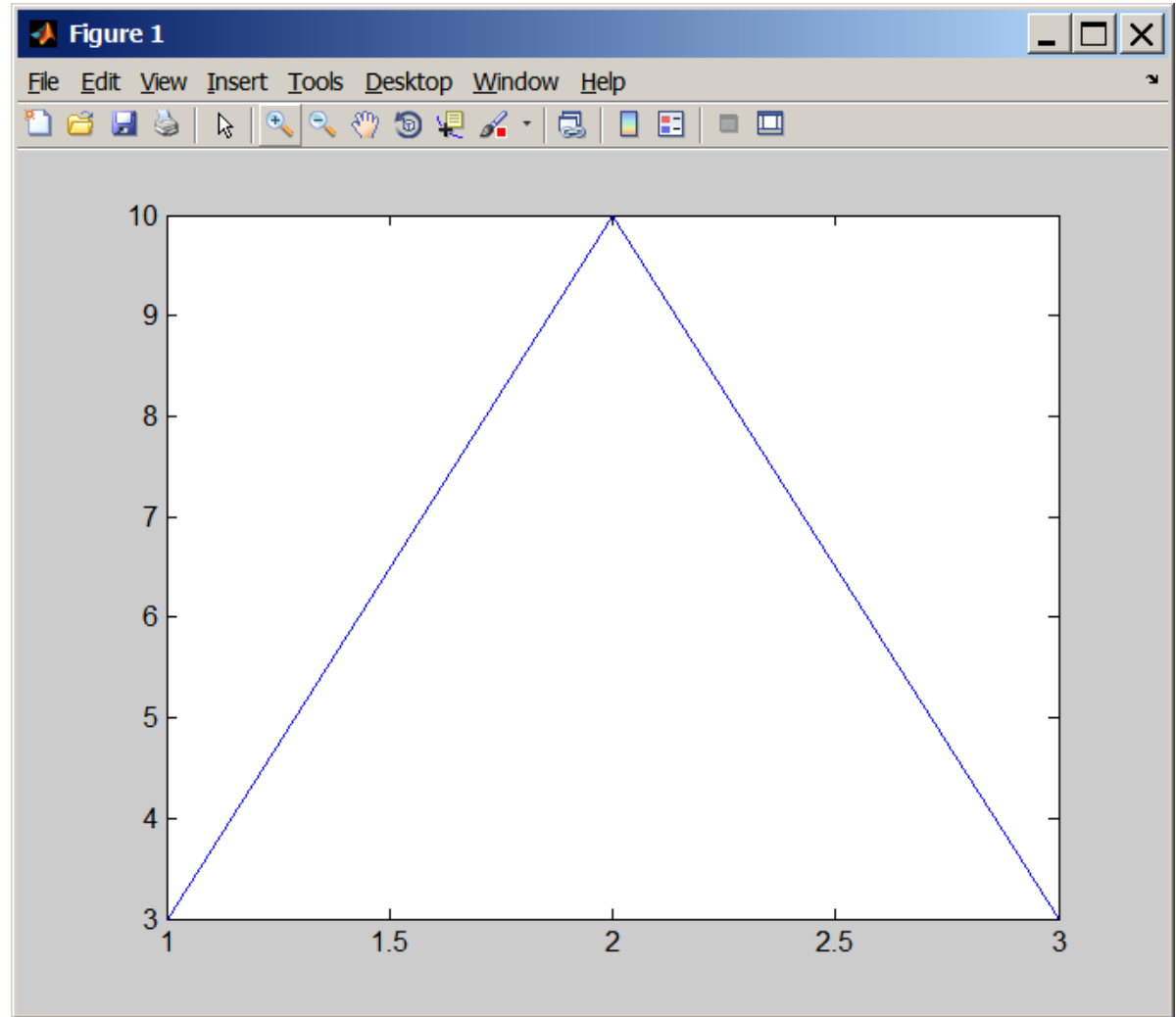


Introduction

- Vectors and Matrices
- Mathematical Operations with Matrices
- Input / Output
- M File
- Functions
- Toolbox
- ...

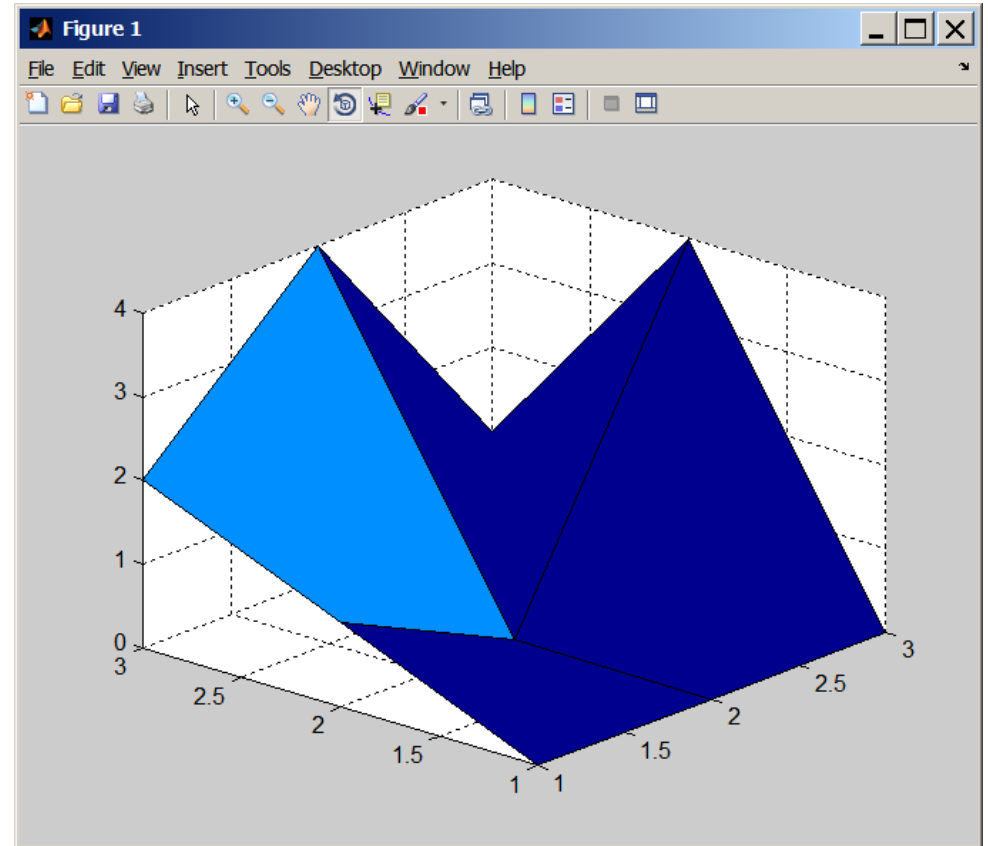
2D Graph

- Plot
- Hold on
- Axis
- Figure
- ...

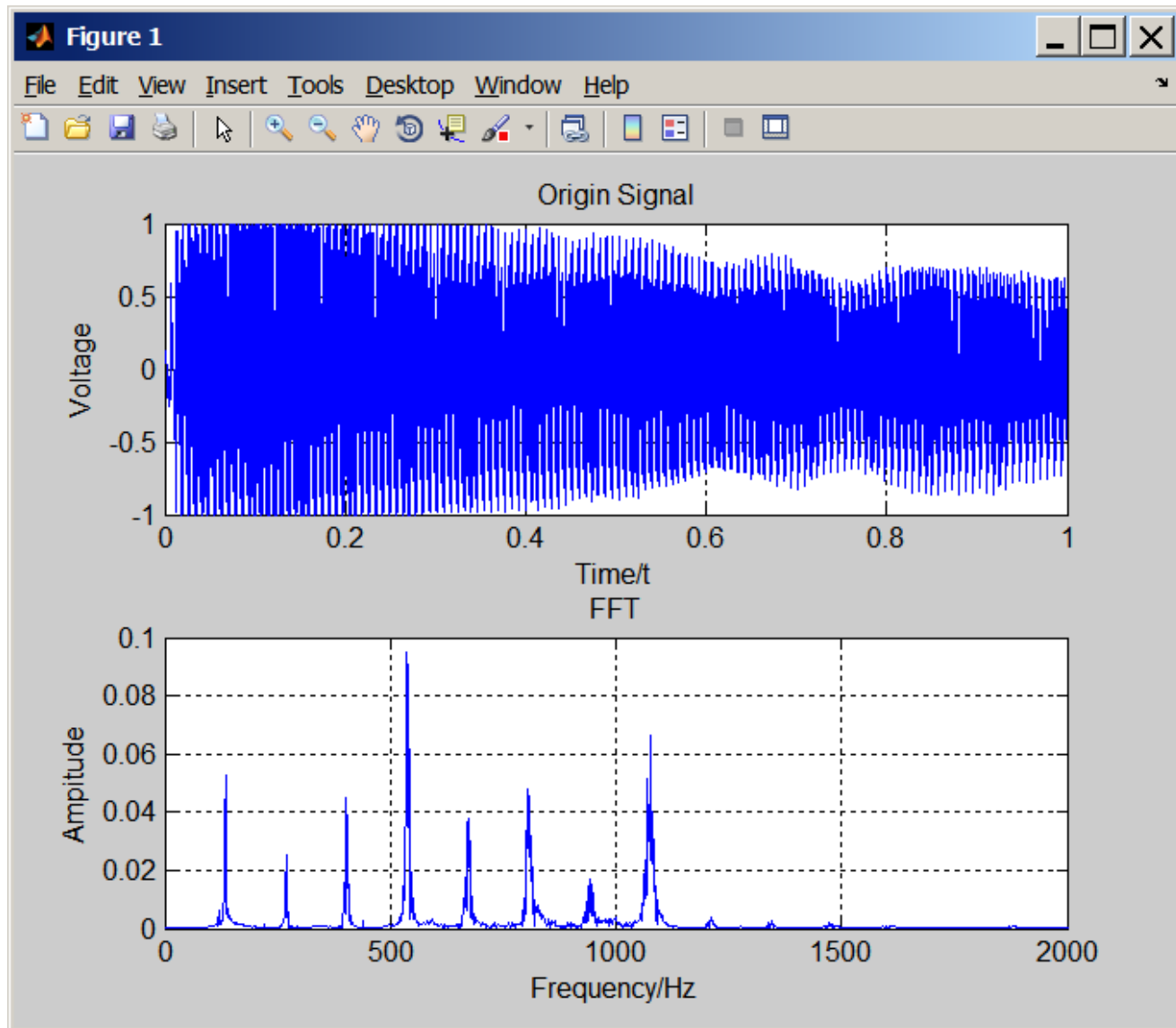


3D Graph

- Surf
- Mesh
- Contour
- ...



Example FFT



Example

Electronic music

```
% Cripple Pachelbel's Canon on Matlab  
% Have fun
```

```
fs = 44100; % sample rate  
dt = 1/fs;
```

```
T16 = 0.125;
```

```
t16 = [0:dt:T16];  
[temp k] = size(t16);
```

```
t4 = linspace(0,4*T16,4*k);  
t8 = linspace(0,2*T16,2*k);
```

```
[temp i] = size(t4);  
[temp j] = size(t8);
```

```
% Modification functions
```

```
mod4 = sin(pi*t4/t4(end));  
mod8 = sin(pi*t8/t8(end));  
mod16 = sin(pi*t16/t16(end));
```

```
f0 = 2*146.8; % reference frequency
```

```
ScaleTable = [2/3 3/4 5/6 15/16 ...  
              1 9/8 5/4 4/3 3/2 5/3 9/5 15/8 ...  
              2 9/4 5/2 8/3 3 10/3 15/4 4 ...  
              1/2 9/16 5/8];
```

```
ScaleTable = [2/3 3/4 5/6 15/16 ...  
              1 9/8 5/4 4/3 3/2 5/3 9/5 15/8 ...  
              2 9/4 5/2 8/3 3 10/3 15/4 4 ...  
              1/2 9/16 5/8];
```

```
% 1/4 notes
```

```
do0f = mod4.*cos(2*pi*ScaleTable(21)*f0*t4);  
re0f = mod4.*cos(2*pi*ScaleTable(22)*f0*t4);  
mi0f = mod4.*cos(2*pi*ScaleTable(23)*f0*t4);
```

```
fa0f = mod4.*cos(2*pi*ScaleTable(1)*f0*t4);  
so0f = mod4.*cos(2*pi*ScaleTable(2)*f0*t4);  
la0f = mod4.*cos(2*pi*ScaleTable(3)*f0*t4);  
ti0f = mod4.*cos(2*pi*ScaleTable(4)*f0*t4);  
do1f = mod4.*cos(2*pi*ScaleTable(5)*f0*t4);  
re1f = mod4.*cos(2*pi*ScaleTable(6)*f0*t4);  
mi1f = mod4.*cos(2*pi*ScaleTable(7)*f0*t4);  
fa1f = mod4.*cos(2*pi*ScaleTable(8)*f0*t4);  
so1f = mod4.*cos(2*pi*ScaleTable(9)*f0*t4);  
la1f = mod4.*cos(2*pi*ScaleTable(10)*f0*t4);  
tb1f = mod4.*cos(2*pi*ScaleTable(11)*f0*t4);  
ti1f = mod4.*cos(2*pi*ScaleTable(12)*f0*t4);  
do2f = mod4.*cos(2*pi*ScaleTable(13)*f0*t4);  
re2f = mod4.*cos(2*pi*ScaleTable(14)*f0*t4);  
mi2f = mod4.*cos(2*pi*ScaleTable(15)*f0*t4);  
fa2f = mod4.*cos(2*pi*ScaleTable(16)*f0*t4);  
so2f = mod4.*cos(2*pi*ScaleTable(17)*f0*t4);  
la2f = mod4.*cos(2*pi*ScaleTable(18)*f0*t4);  
ti2f = mod4.*cos(2*pi*ScaleTable(19)*f0*t4);  
do3f = mod4.*cos(2*pi*ScaleTable(20)*f0*t4);  
blkf = zeros(1,i);
```


Thank you !