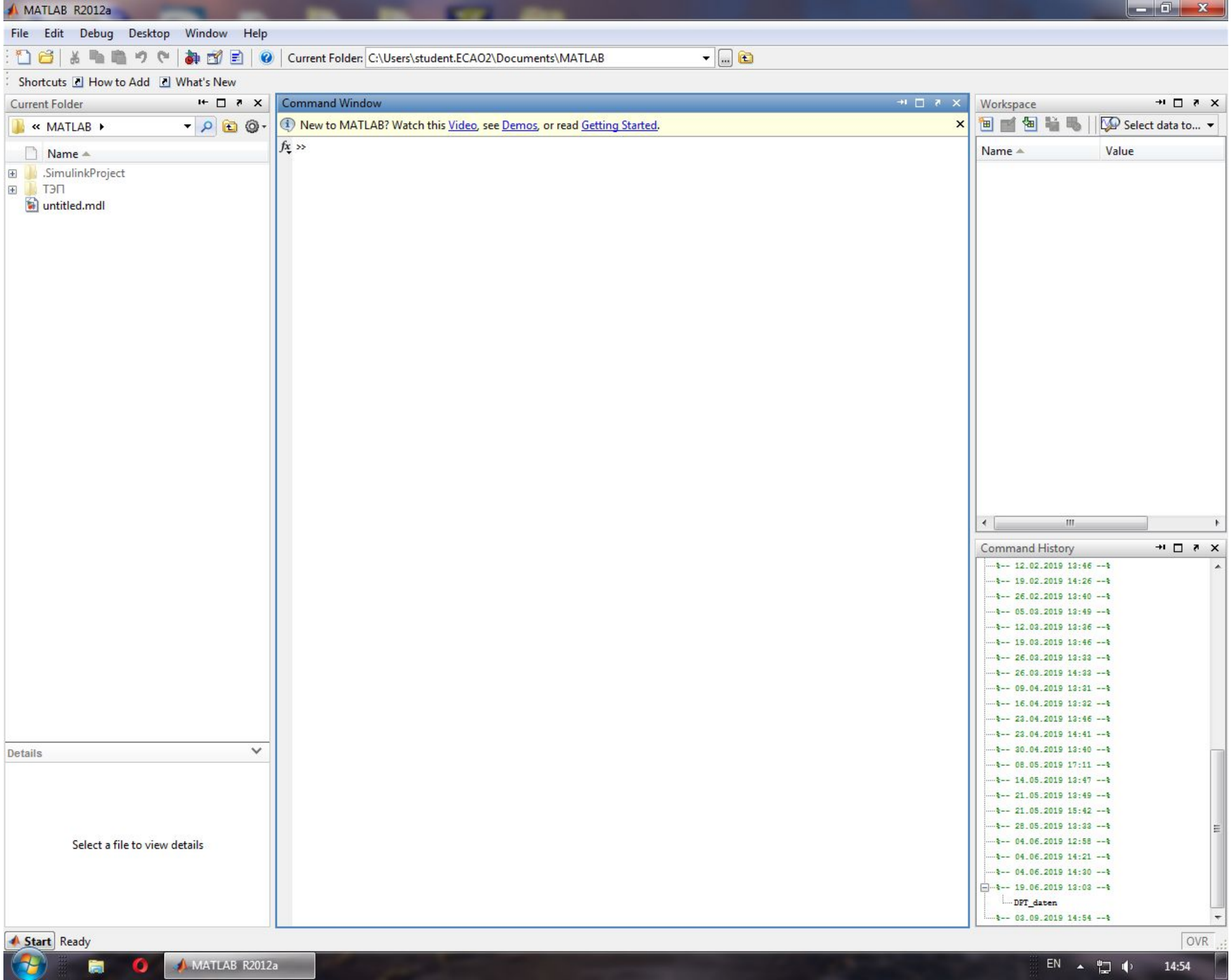
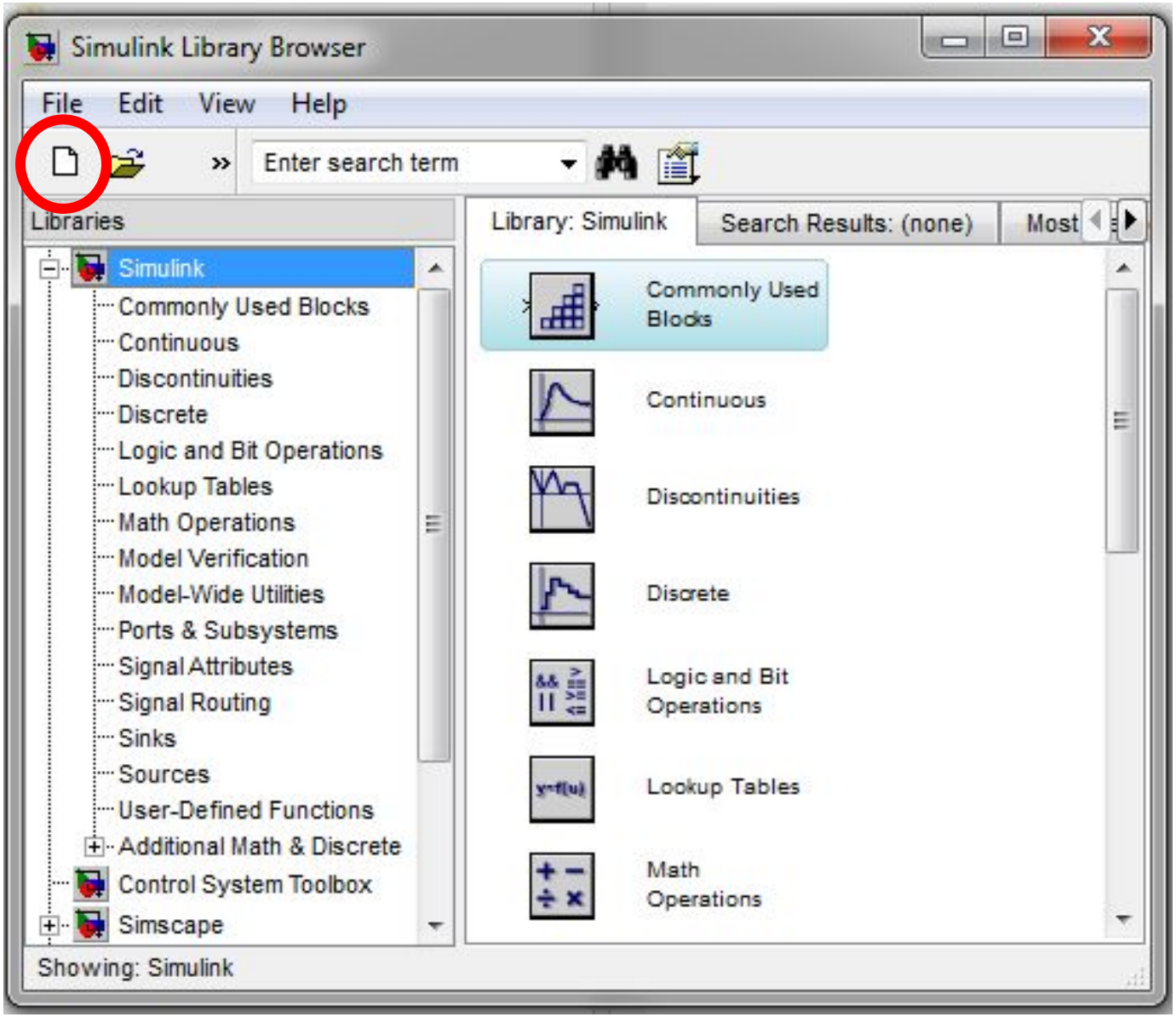
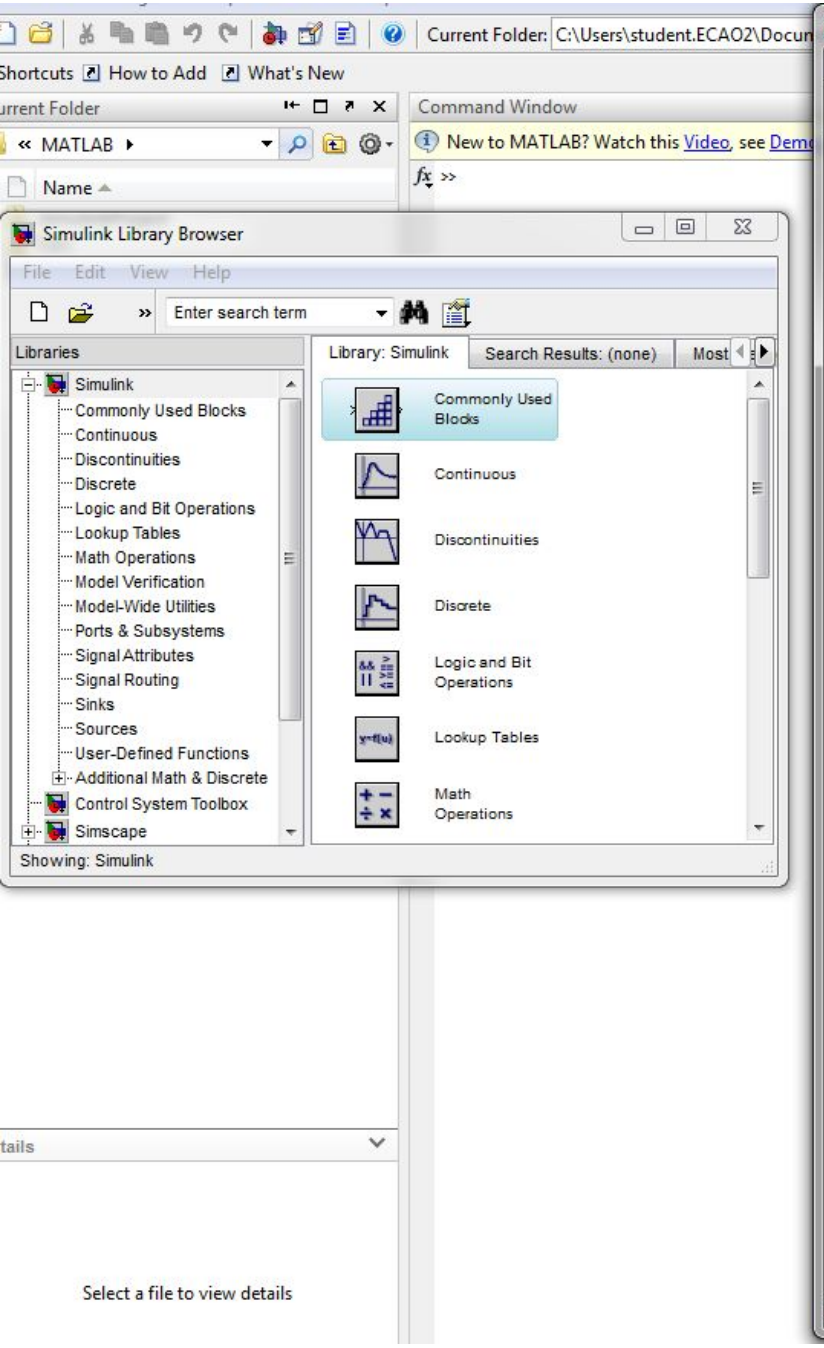
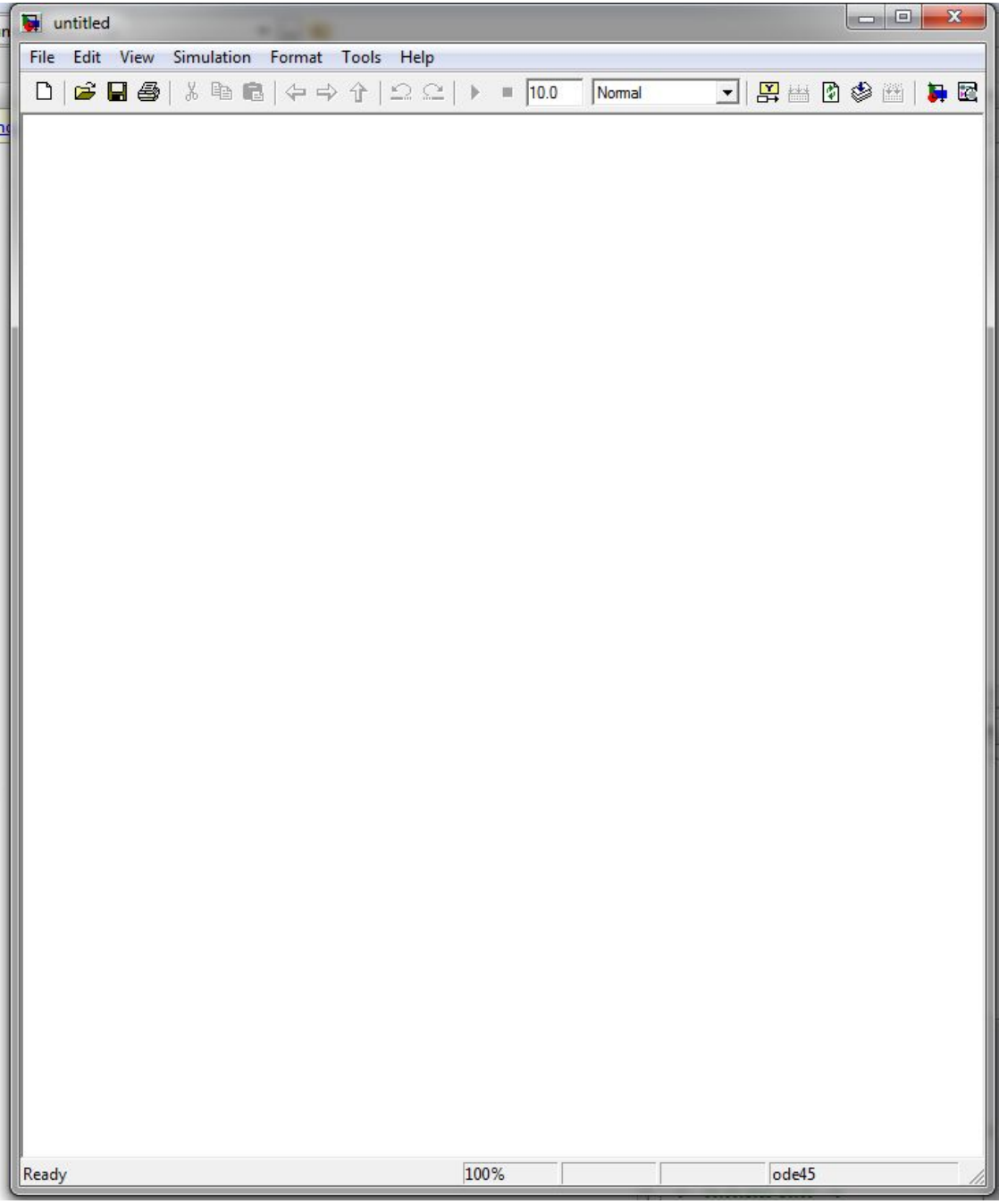
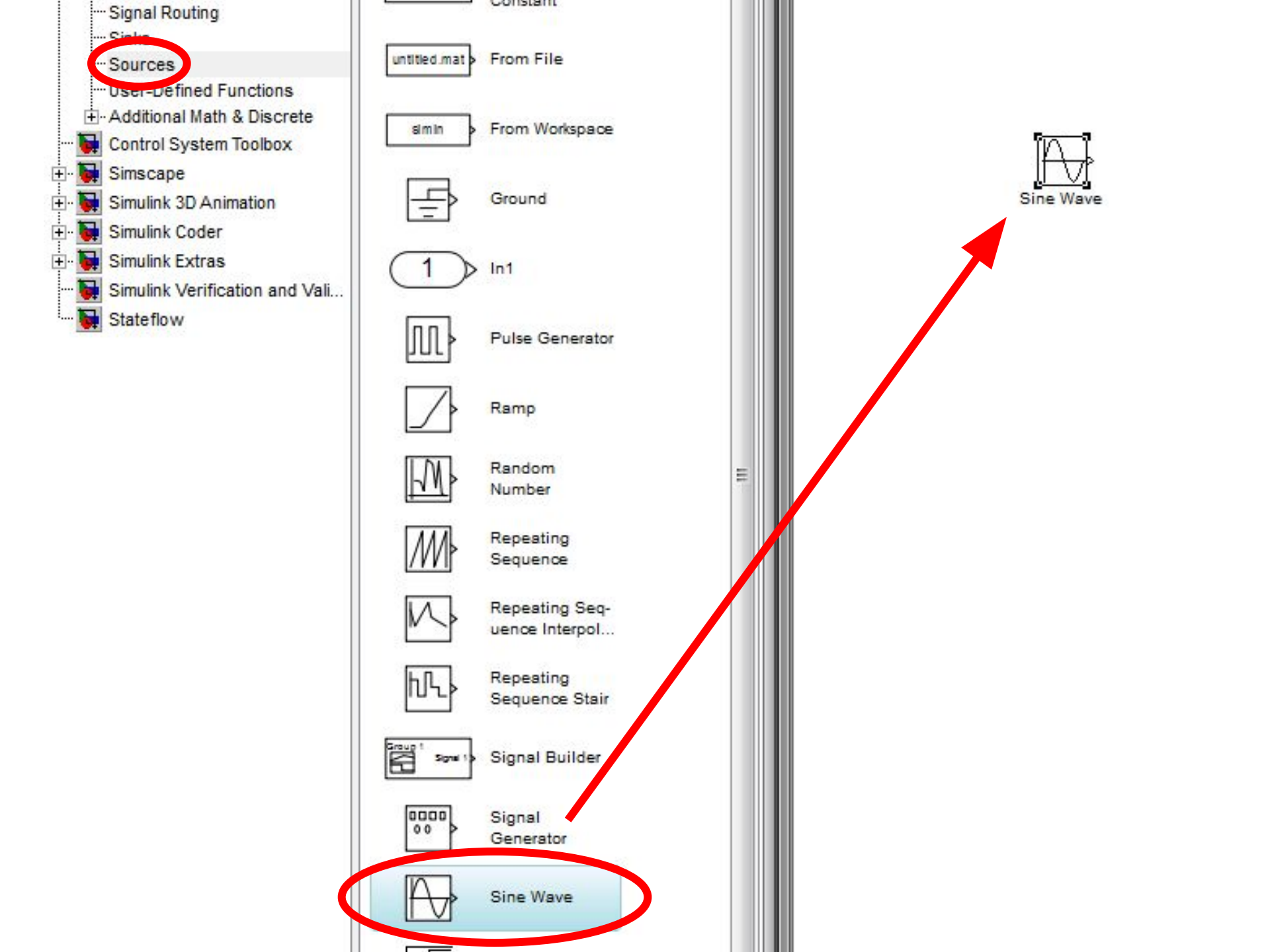

MATLAB R2012a
File Edit Debug Desktop Window Help
Current Folder: C:\Users\student.ECAO2\Documents\MATLAB
Shortcuts How to Add What's New
Current Folder
« MATLAB ▸
Name
.SimulinkProject
ТЭП
untitled.mdl
Command Window
New to MATLAB? Watch this Video, see Demos, or read Getting Started.
fx >>
Workspace
Select data to...
Name
Value
Command History
%-- 12.02.2019 13:46 --%
%-- 19.02.2019 14:26 --%
%-- 26.02.2019 13:40 --%
%-- 05.03.2019 13:49 --%
%-- 12.03.2019 13:36 --%
%-- 19.03.2019 13:46 --%
%-- 26.03.2019 13:33 --%
%-- 26.03.2019 14:33 --%
%-- 09.04.2019 13:31 --%
%-- 16.04.2019 13:32 --%
%-- 23.04.2019 13:46 --%
%-- 23.04.2019 14:41 --%
%-- 30.04.2019 13:40 --%
%-- 08.05.2019 17:11 --%
%-- 14.05.2019 13:47 --%
%-- 21.05.2019 13:49 --%
%-- 21.05.2019 15:42 --%
%-- 28.05.2019 13:33 --%
%-- 04.06.2019 12:58 --%
%-- 04.06.2019 14:21 --%
%-- 04.06.2019 14:30 --%
%-- 19.06.2019 13:03 --%
DPT_daten
%-- 03.09.2019 14:54 --%
Details
Select a file to view details
Start Ready
OVR
MATLAB R2012a
EN
14:54

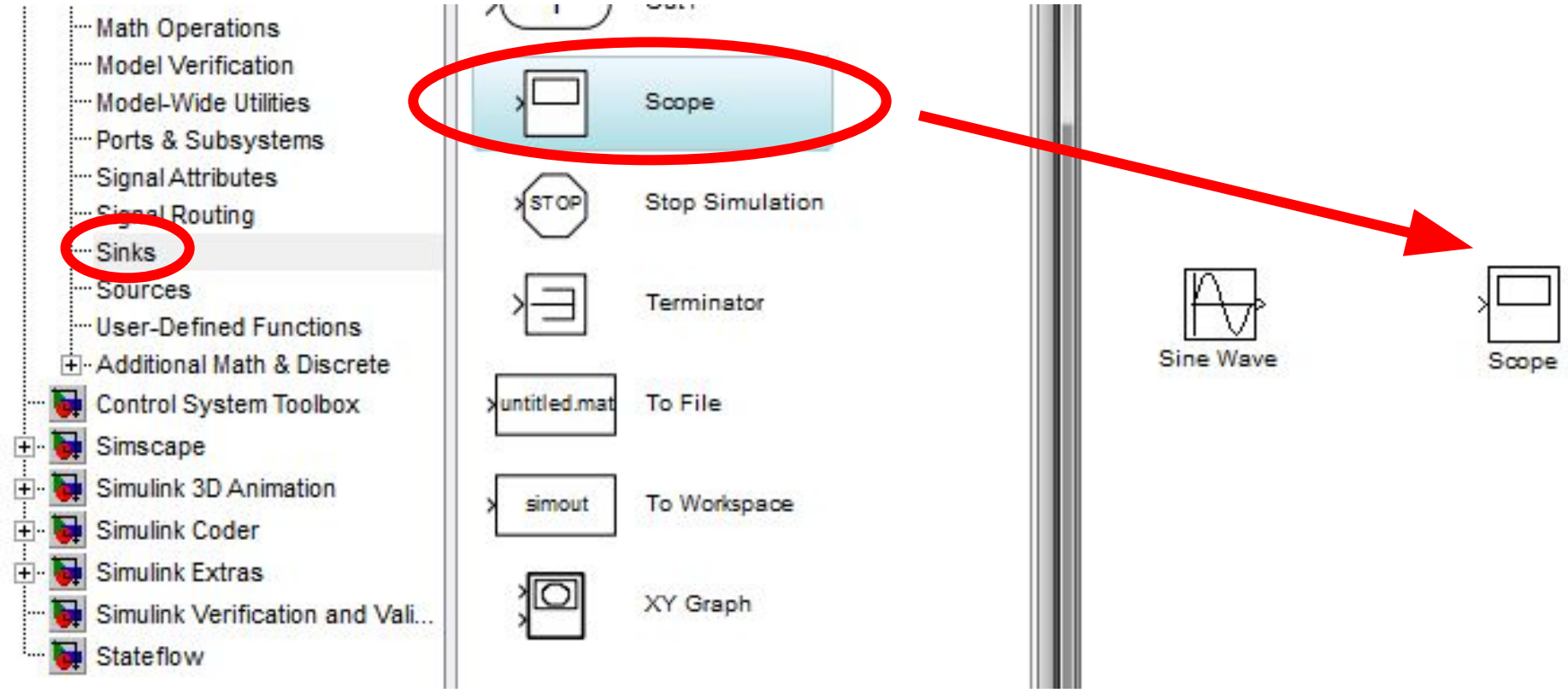
Simulink library browser

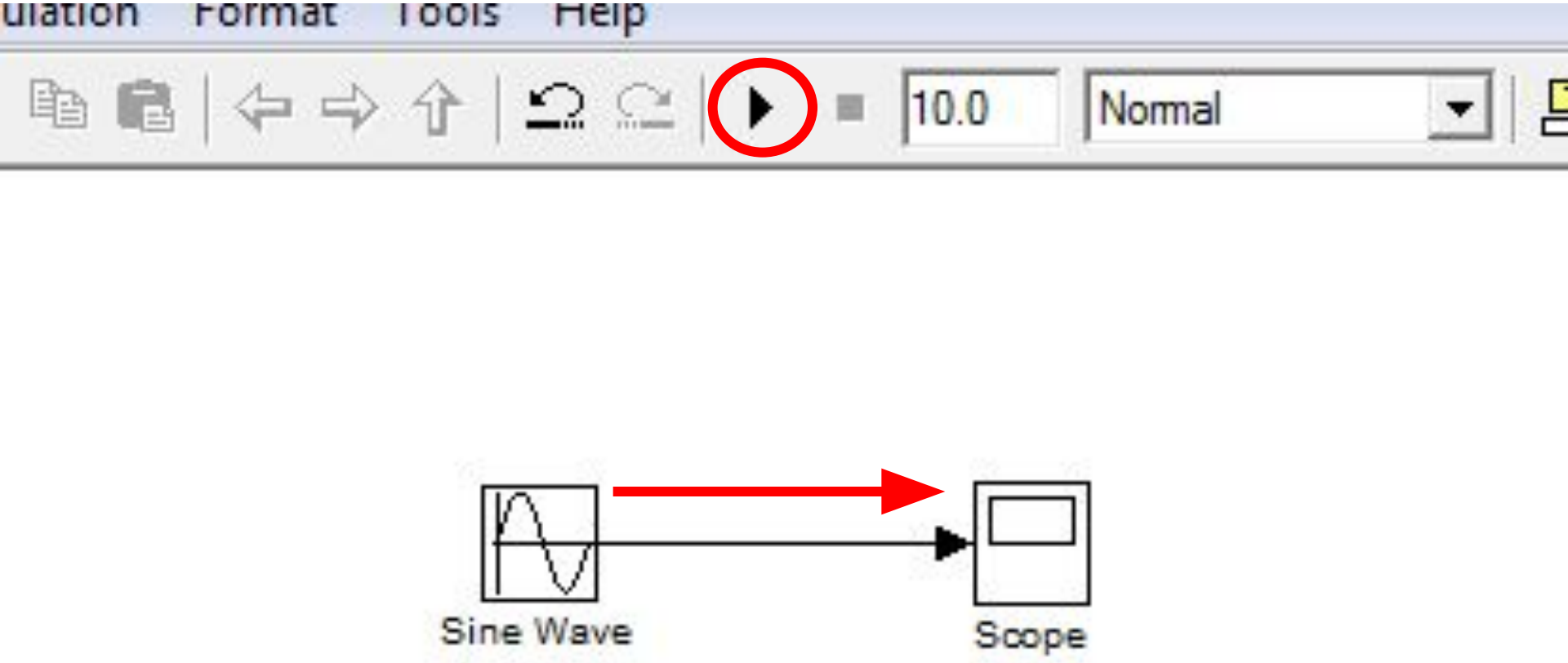

Simulink Library Browser
File
Edit
View
Help
Enter search term
Libraries
Library: Simulink
Search Results: (none)
Most
Simulink
Commonly Used Blocks
Continuous
Discontinuities
Discrete
Logic and Bit Operations
Lookup Tables
Math Operations
Model Verification
Model-Wide Utilities
Ports & Subsystems
Signal Attributes
Signal Routing
Sinks
Sources
User-Defined Functions
Additional Math & Discrete
Control System Toolbox
Simscape
Commonly Used Blocks
Continuous
Discontinuities
Discrete
Logic and Bit Operations
Lookup Tables
Math Operations
Showing: Simulink

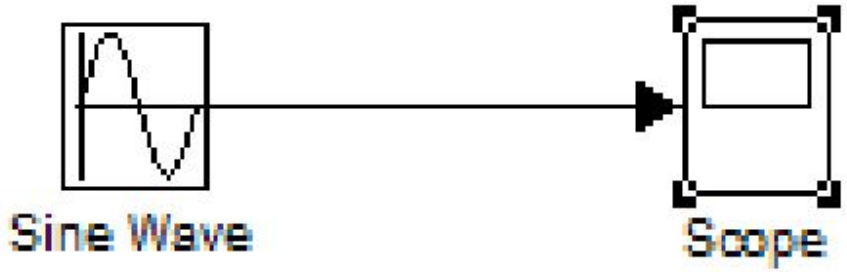

Current Folder: C:\Users\student.ECAO2\Docu
Shortcuts How to Add What's New
Current Folder
MATLAB
Name
Command Window
New to MATLAB? Watch this Video, see Demo
>>
Simulink Library Browser
File Edit View Help
Enter search term
Libraries
Simulink
Commonly Used Blocks
Continuous
Discontinuities
Discrete
Logic and Bit Operations
Lookup Tables
Math Operations
Model Verification
Model-Wide Utilities
Ports & Subsystems
Signal Attributes
Signal Routing
Sinks
Sources
User-Defined Functions
Additional Math & Discrete
Control System Toolbox
Simscape
Library: Simulink
Search Results: (none)
Most
Commonly Used Blocks
Continuous
Discontinuities
Discrete
Logic and Bit Operations
Lookup Tables
Math Operations
Showing: Simulink
tails
Select a file to view details

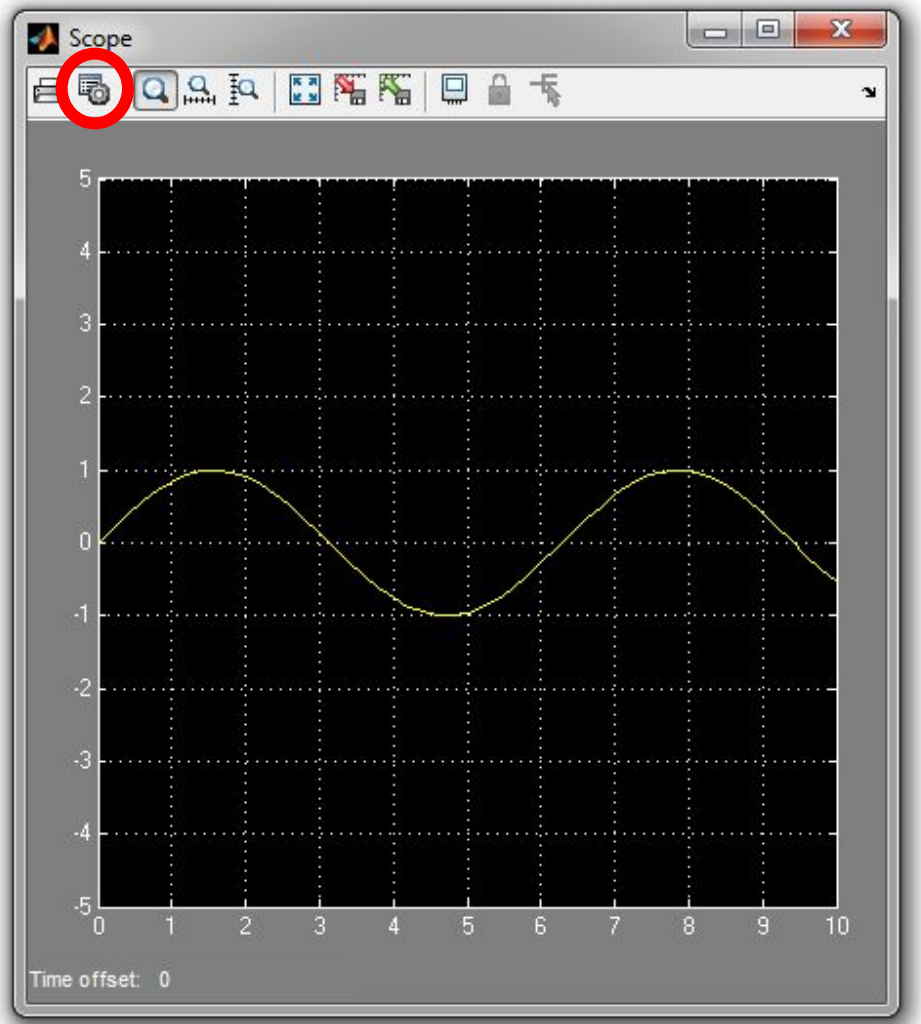

untitled
File Edit View Simulation Format Tools Help
10.0
Normal
Ready
100%
ode45

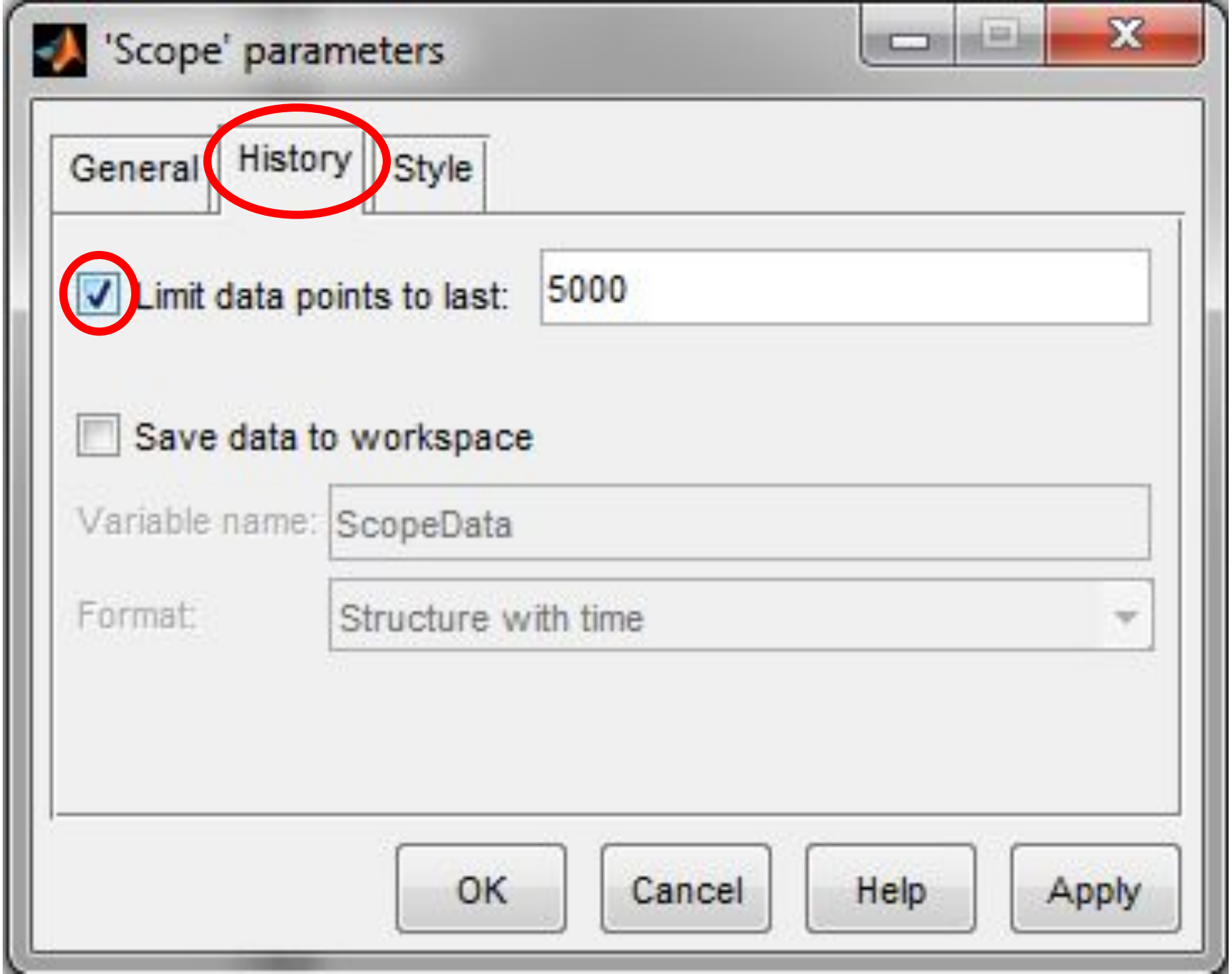

Signal Routing
Sources
User-Defined Functions
Additional Math & Discrete
Control System Toolbox
Simscape
Simulink 3D Animation
Simulink Coder
Simulink Extras
Simulink Verification and Vali...
Stateflow
untitled.mat
From File
simin
From Workspace
Ground
1
In1
Pulse Generator
Ramp
Random Number
Repeating Sequence
Repeating Seq- uence Interpol...
Repeating Sequence Stair
Signal Builder
Signal Generator
Sine Wave
Sine Wave

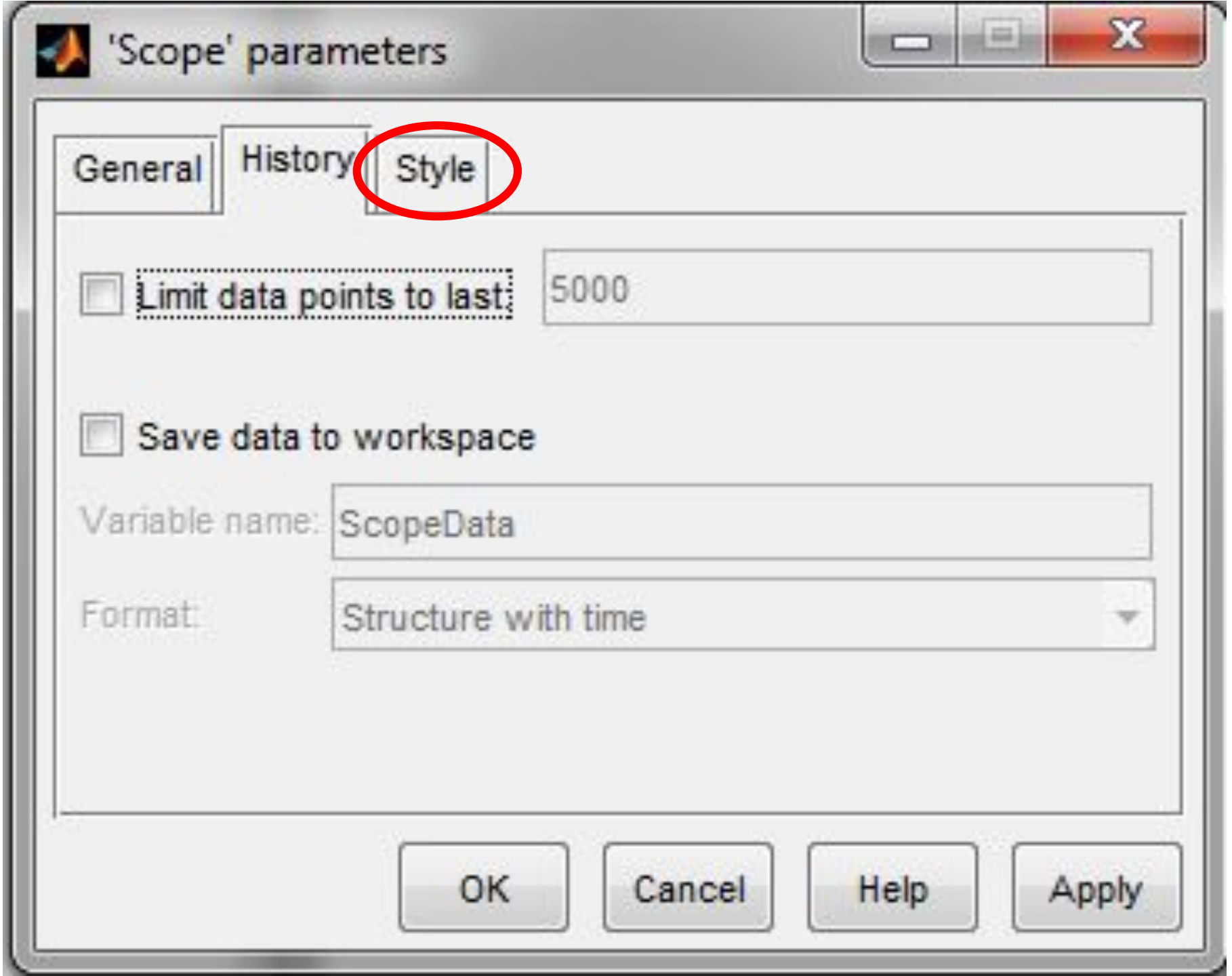

Math Operations
Model Verification
Model-Wide Utilities
Ports & Subsystems
Signal Attributes
Signal Routing
Sinks
Sources
User-Defined Functions
Additional Math & Discrete
Control System Toolbox
Simscape
Simulink 3D Animation
Simulink Coder
Simulink Extras
Simulink Verification and Vali...
Stateflow
Scope
STOP
Stop Simulation
Terminator
untitled.mat
To File
simout
To Workspace
XY Graph
Sine Wave
Scope

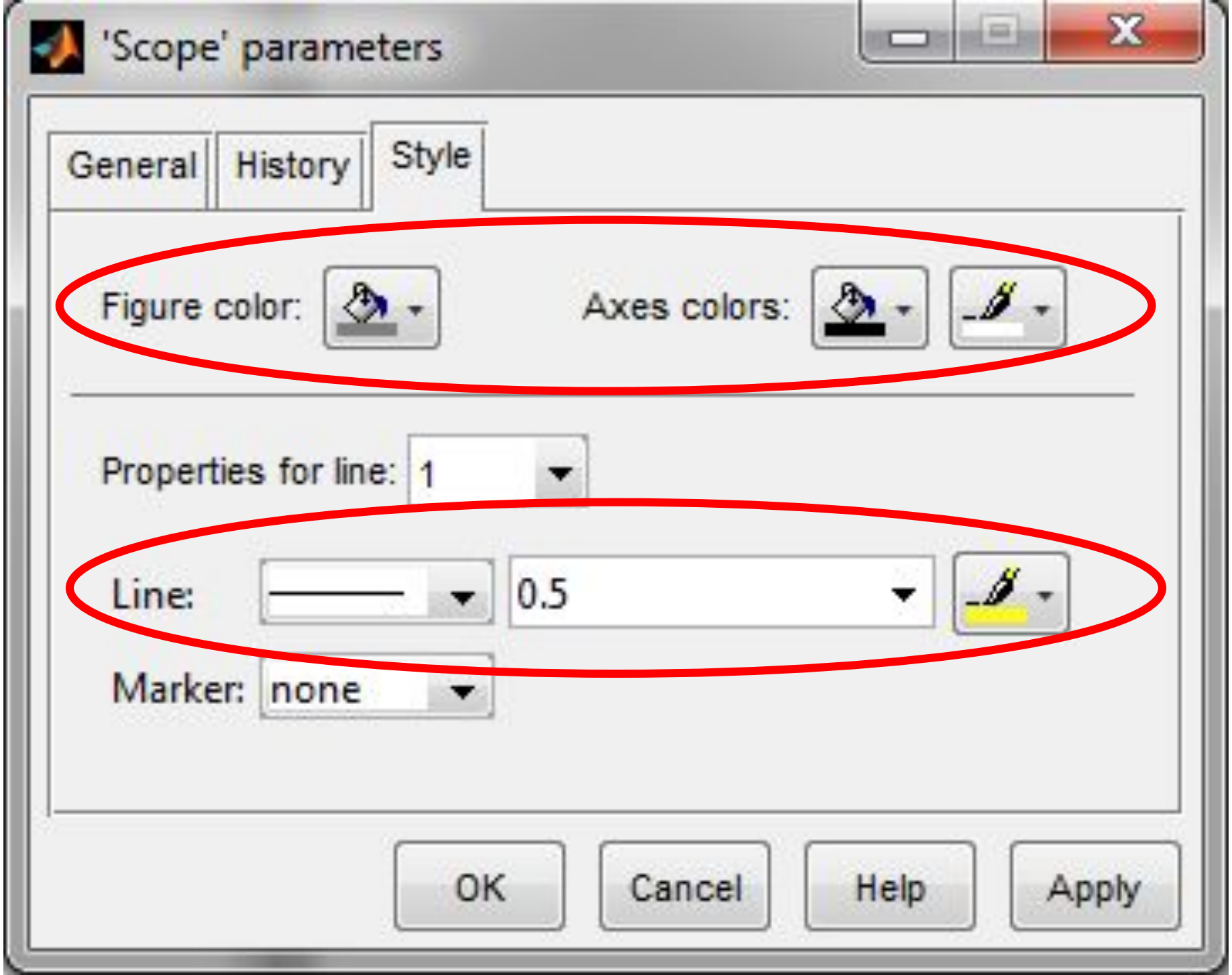

ulation Format Tools Help
10.0
Normal
Sine Wave
Scope

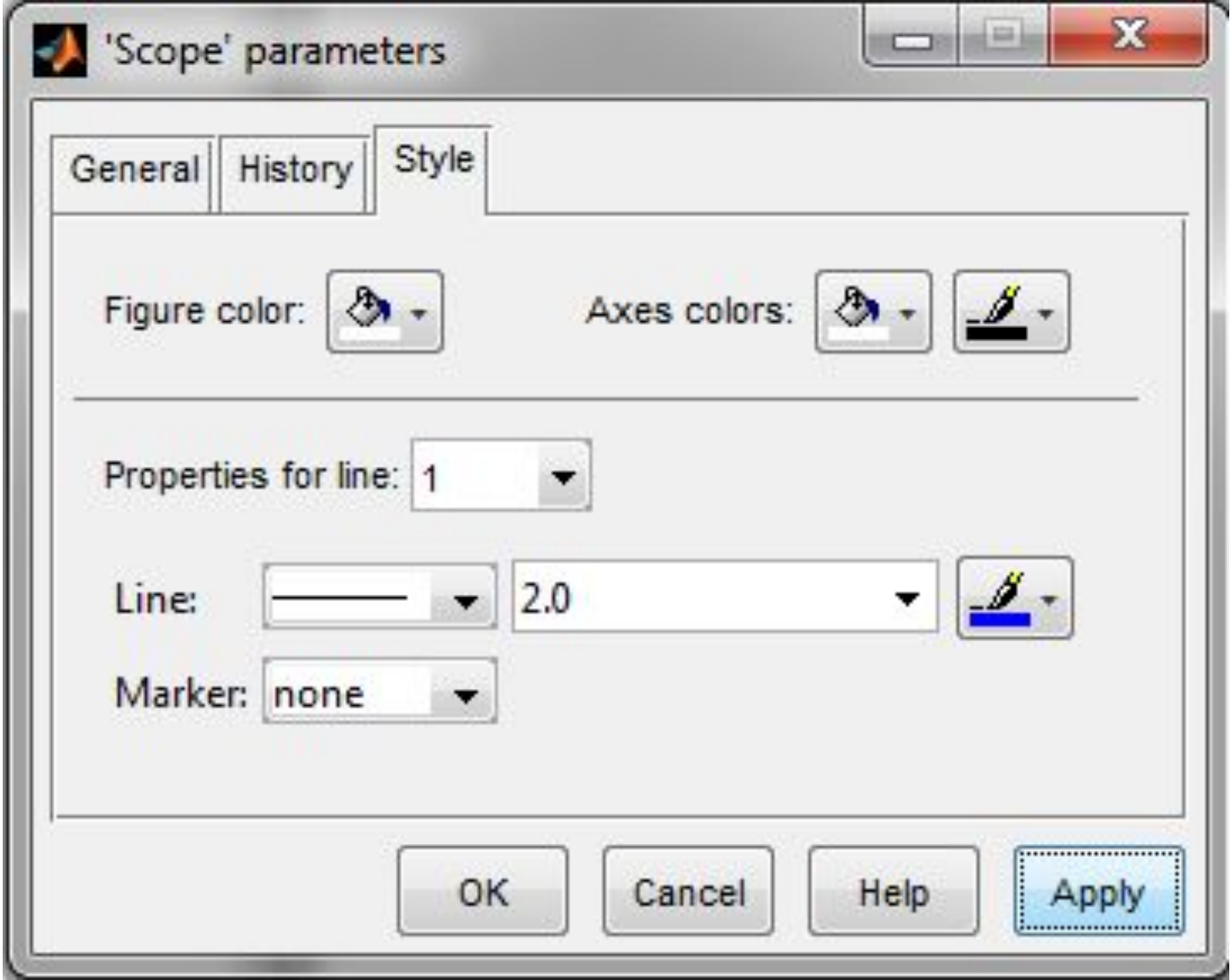

Sine Wave
Scope

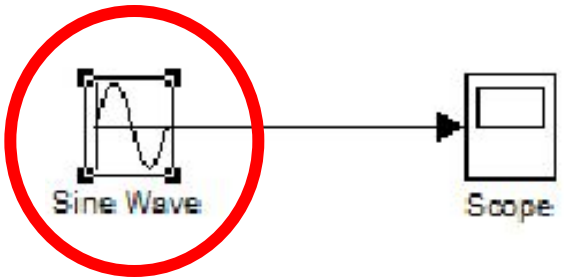

Scope
5
4
3
2
1
0
-1
-2
-3
-4
-5
0
1
2
3
4
5
6
7
8
9
10
Time offset: 0


'Scope' parameters
General
History
Style
Limit data points to last:
5000
Save data to workspace
Variable name:
ScopeData
Format:
Structure with time
OK
Cancel
Help
Apply


'Scope' parameters
General
History
Style
Limit data points to last
5000
Save data to workspace
Variable name:
ScopeData
Format:
Structure with time
OK
Cancel
Help
Apply


'Scope' parameters
General
History
Style
Figure color:
Axes colors:
Properties for line:
1
Line:
0.5
Marker:
none
OK
Cancel
Help
Apply


'Scope' parameters
General
History
Style
Figure color:
Axes colors:
Properties for line:
1
Line:
2.0
Marker:
none
OK
Cancel
Help
Apply



Source Block Parameters: Sine Wave

Sine Wave

Output a sine wave:

O(t) = Amp*Sin(Freq*t+Phase) + Bias

Sine type determines the computational technique used. The parameters in the two types are related through:

Samples per period = 2*pi / (Frequency * Sample time)

Number of offset samples = Phase * Samples per period / (2*pi)

Use the sample-based sine type if numerical problems due to running for large times (e.g. overflow in absolute time) occur.

Parameters

Sine type: Time based

Time (t): Use simulation time

Amplitude:

1

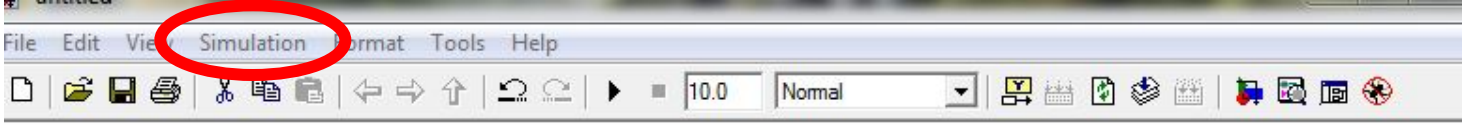
Bias:

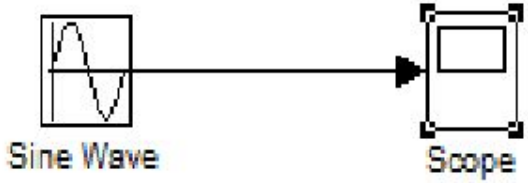
0

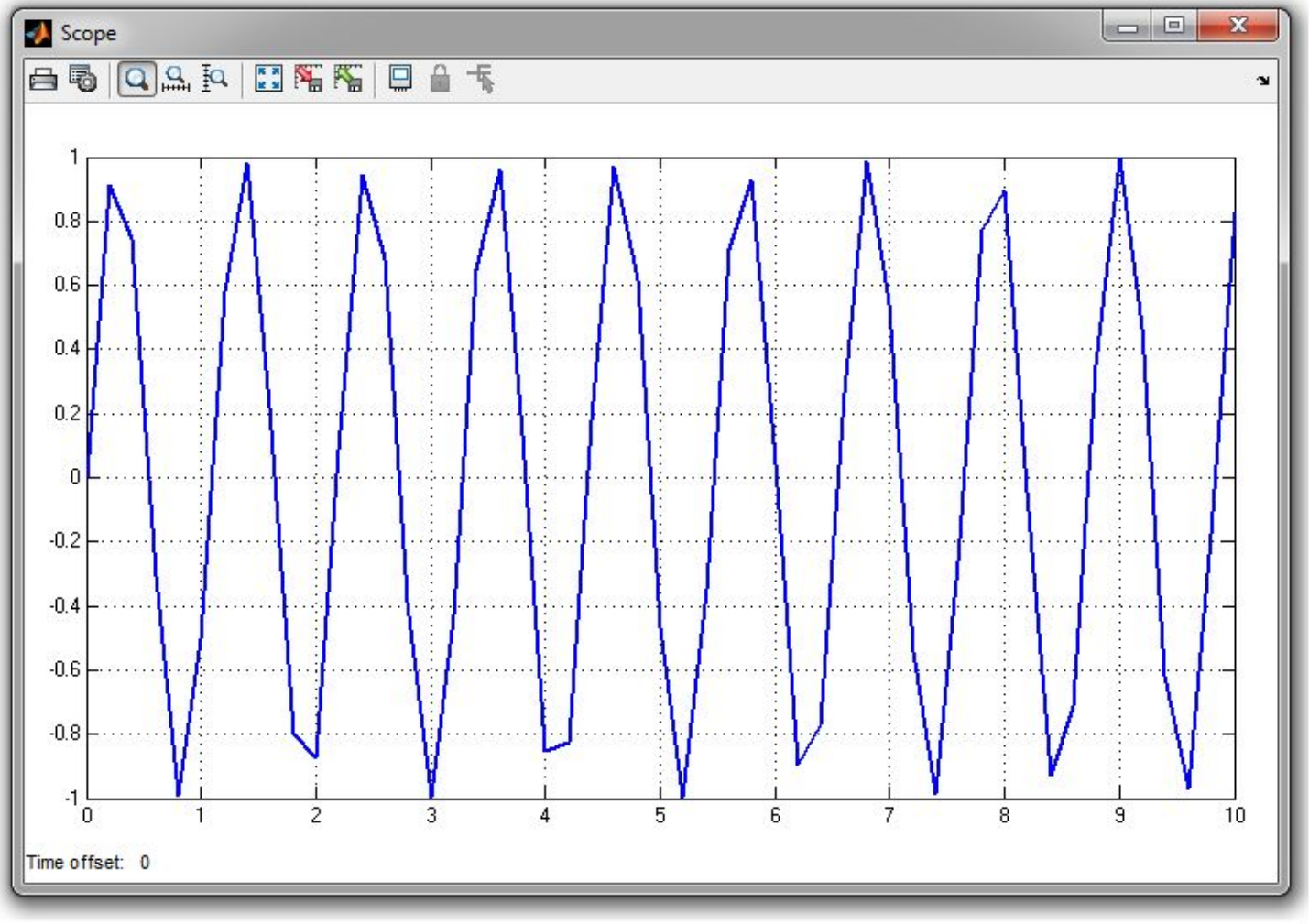
Frequency:

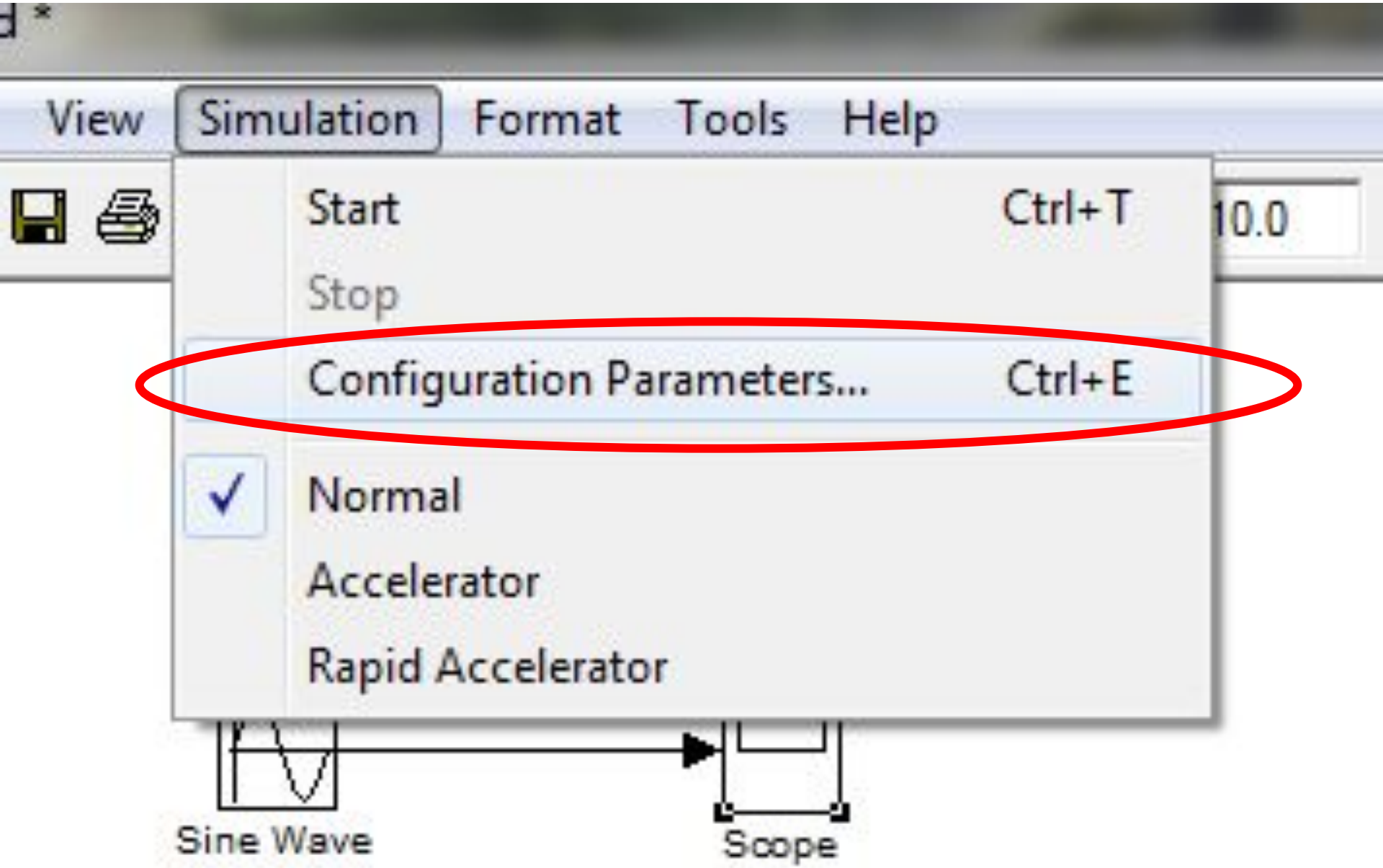
100

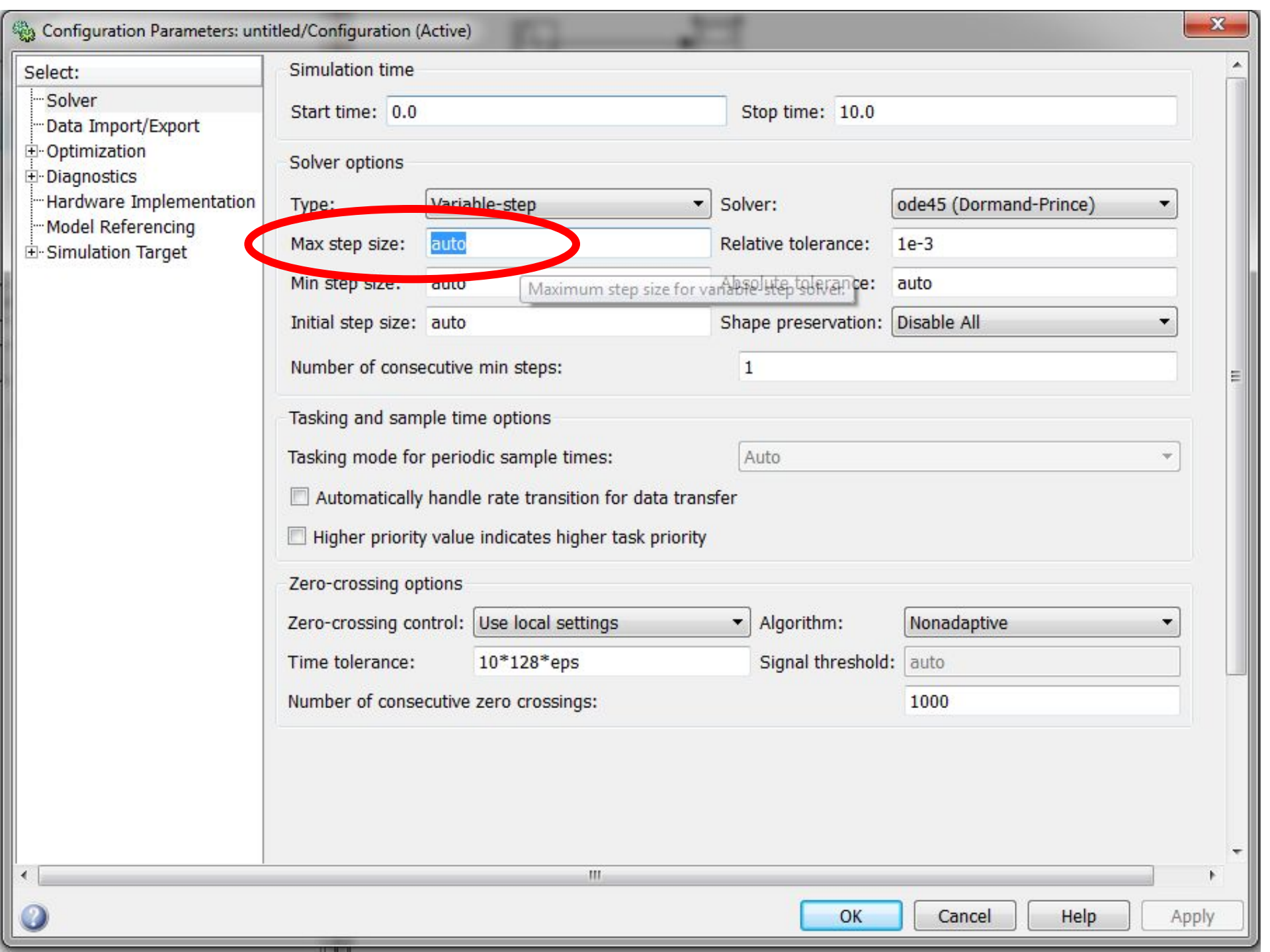
Phase (rad):

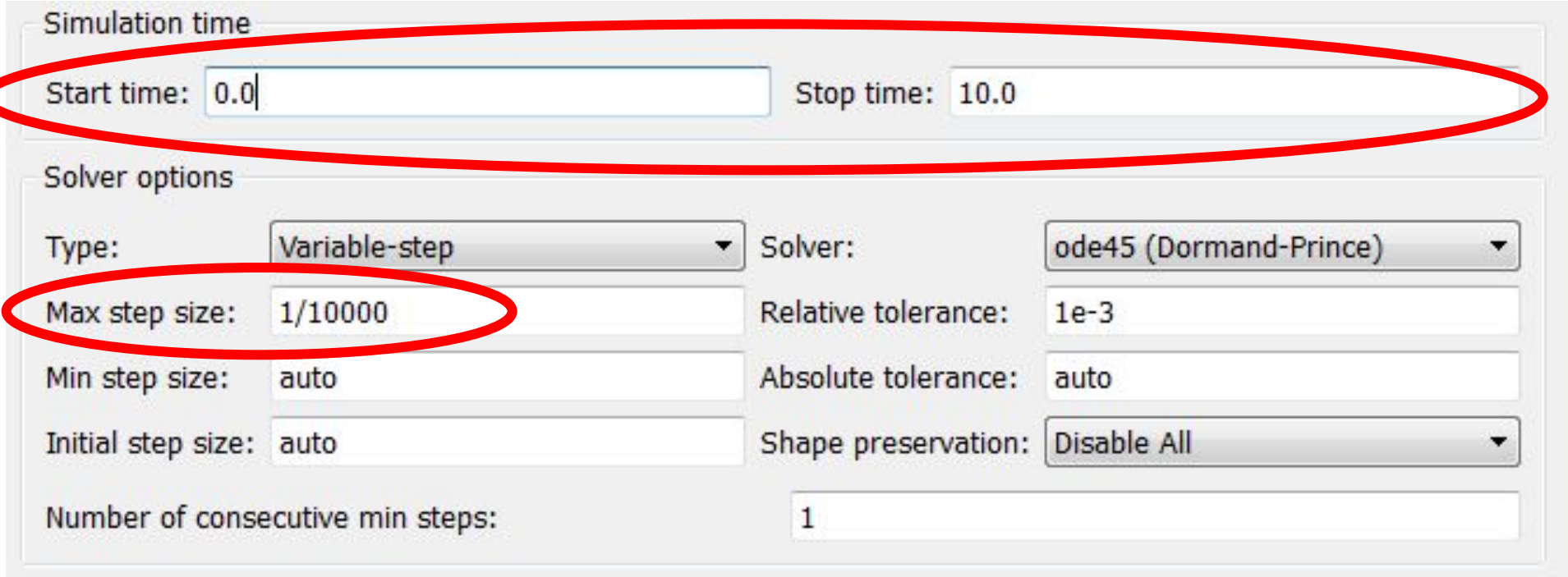

File
Edit
Simulation
Format
Tools
Help
10.0
Normal

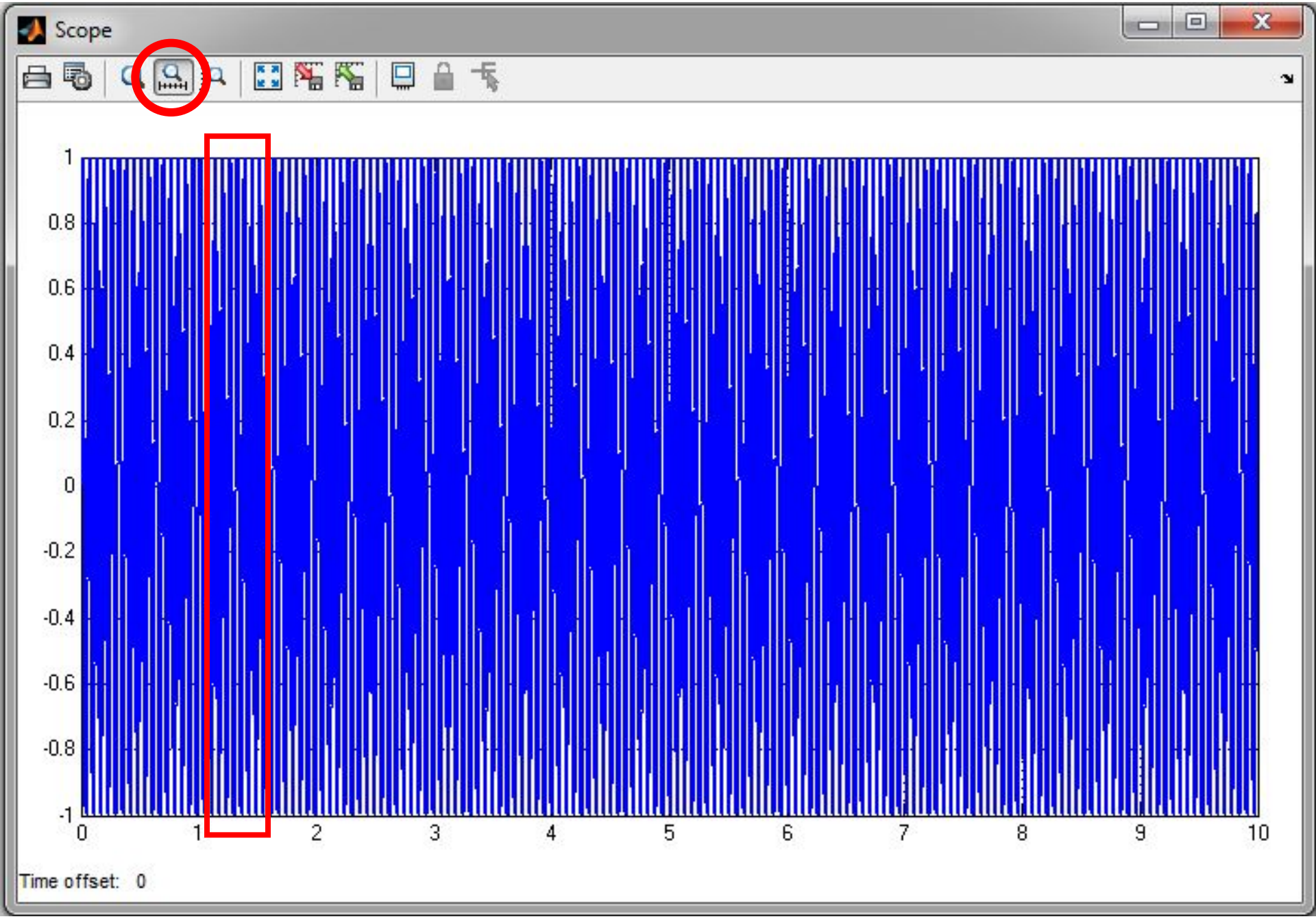

Sine Wave
Scope

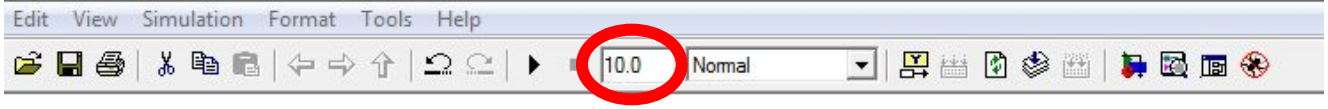

Scope
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
1
2
3
4
5
6
7
8
9
10
Time offset: 0


View
Simulation
Format
Tools
Help
Start Ctrl+T
Stop
Configuration Parameters... Ctrl+E
Normal
Accelerator
Rapid Accelerator
10.0
Sine Wave
Scope


Configuration Parameters: untitled/Configuration (Active)
Select:
Solver
Data Import/Export
Optimization
Diagnostics
Hardware Implementation
Model Referencing
Simulation Target
Simulation time
Start time: 0.0
Stop time: 10.0
Solver options
Type: Variable-step
Solver: ode45 (Dormand-Prince)
Max step size: auto
Relative tolerance: 1e-3
Min step size: auto
Absolute tolerance: auto
Maximum step size for variable-step solver.
Initial step size: auto
Shape preservation: Disable All
Number of consecutive min steps: 1
Tasking and sample time options
Tasking mode for periodic sample times: Auto
Automatically handle rate transition for data transfer
Higher priority value indicates higher task priority
Zero-crossing options
Zero-crossing control: Use local settings
Algorithm: Nonadaptive
Time tolerance: 10*128*eps
Signal threshold: auto
Number of consecutive zero crossings: 1000
OK
Cancel
Help
Apply

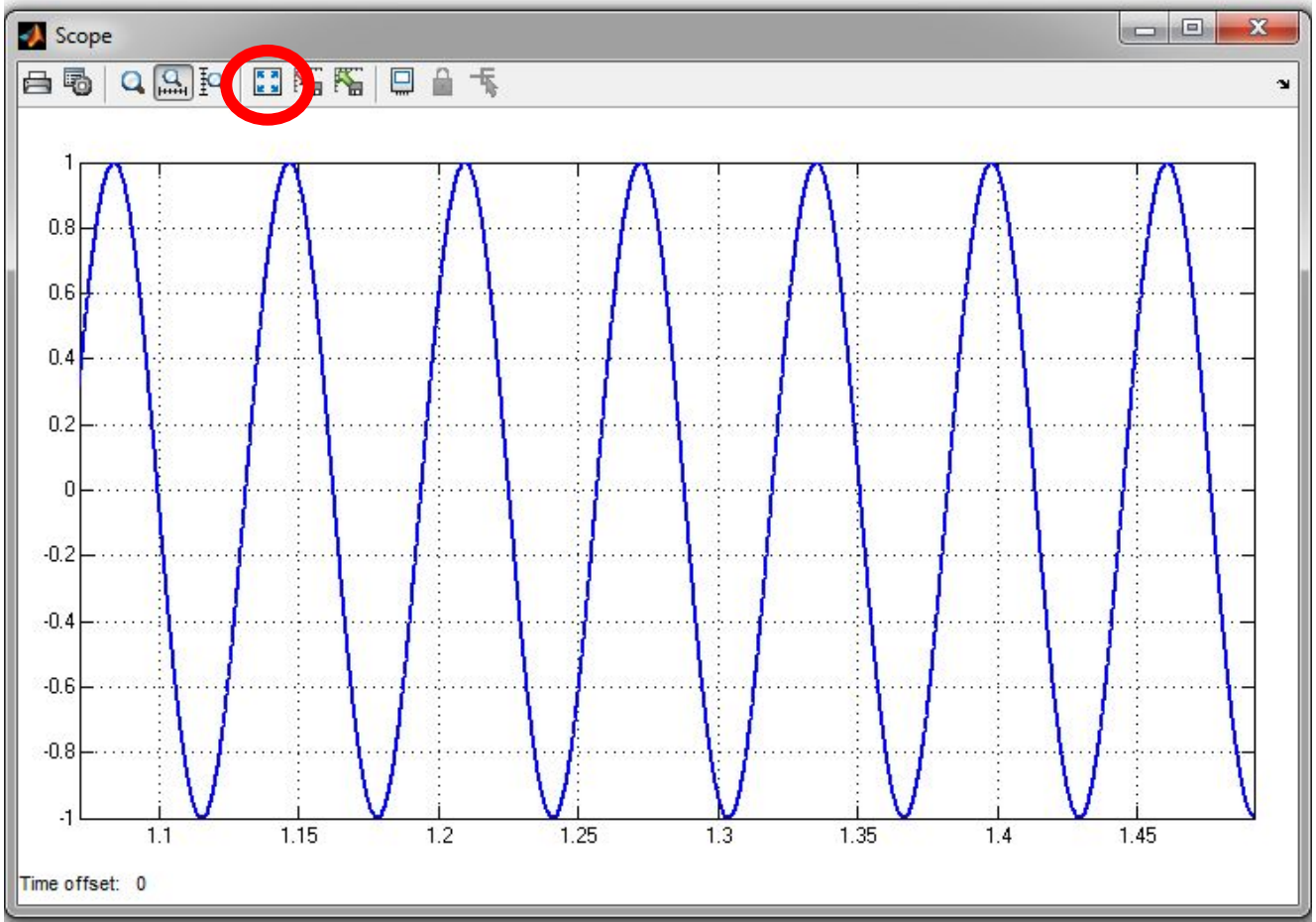

Simulation time
Start time: 0.0
Stop time: 10.0
Solver options
Type: Variable-step
Solver: ode45 (Dormand-Prince)
Max step size: 1/10000
Relative tolerance: 1e-3
Min step size: auto
Absolute tolerance: auto
Initial step size: auto
Shape preservation: Disable All
Number of consecutive min steps: 1

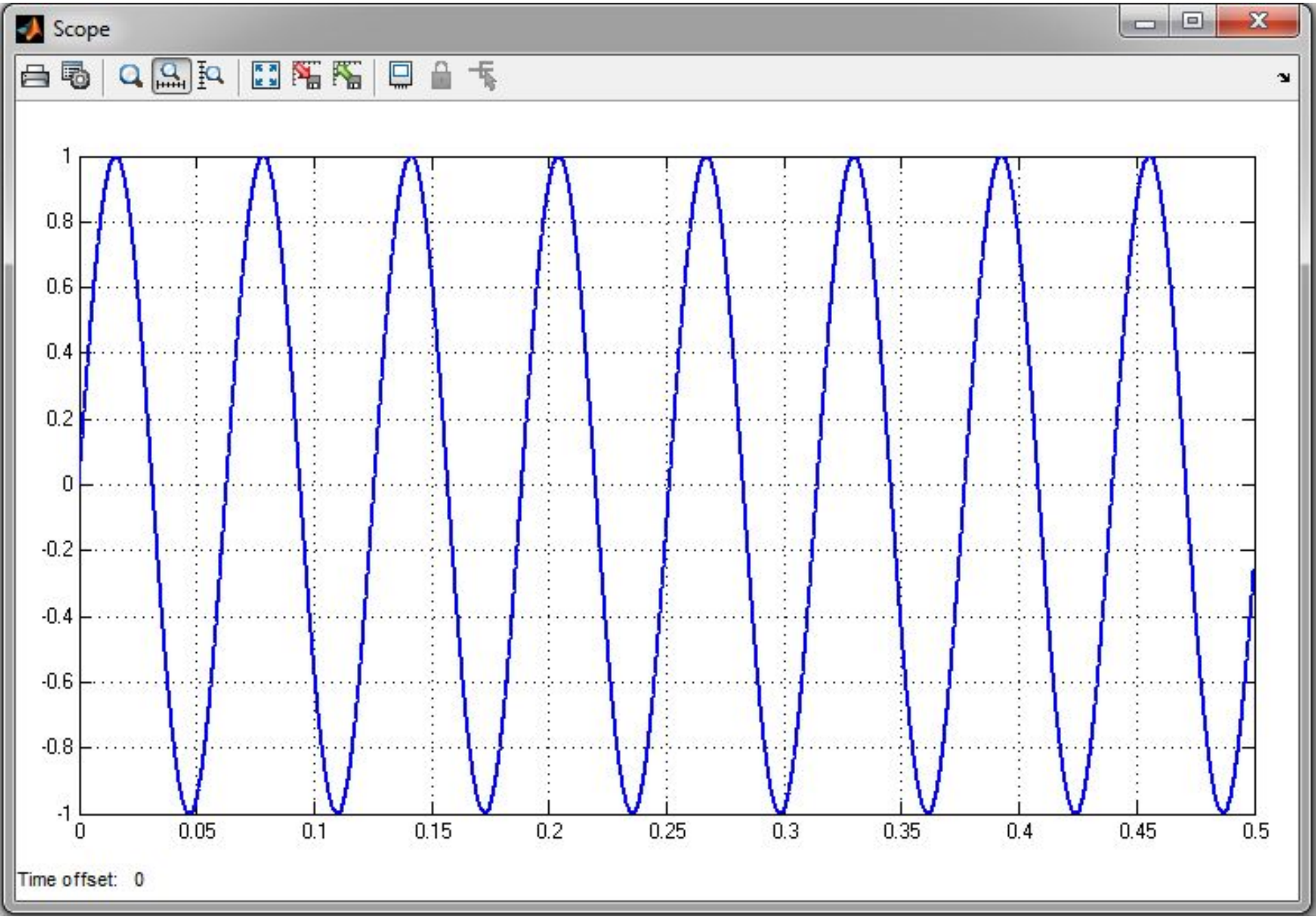

Scope
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
1
2
3
4
5
6
7
8
9
10
Time offset: 0

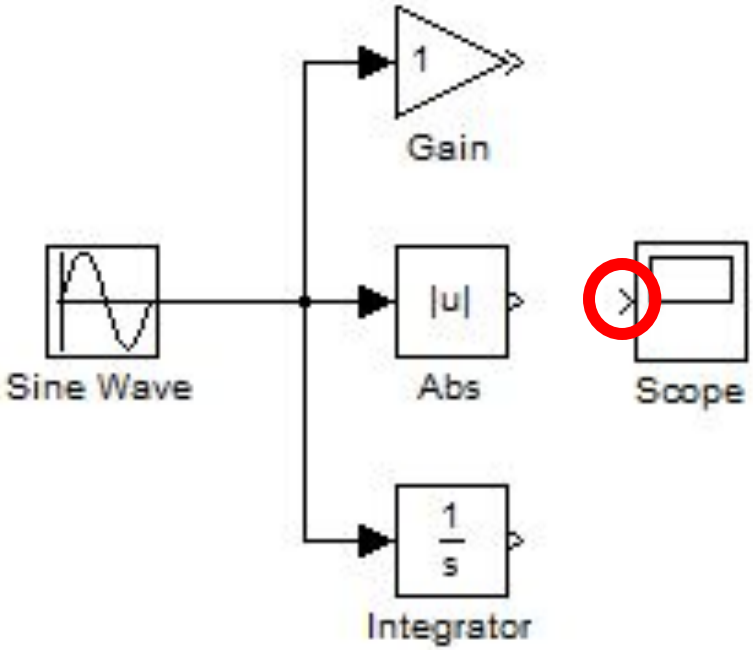

Edit View Simulation Format Tools Help
10.0
Normal

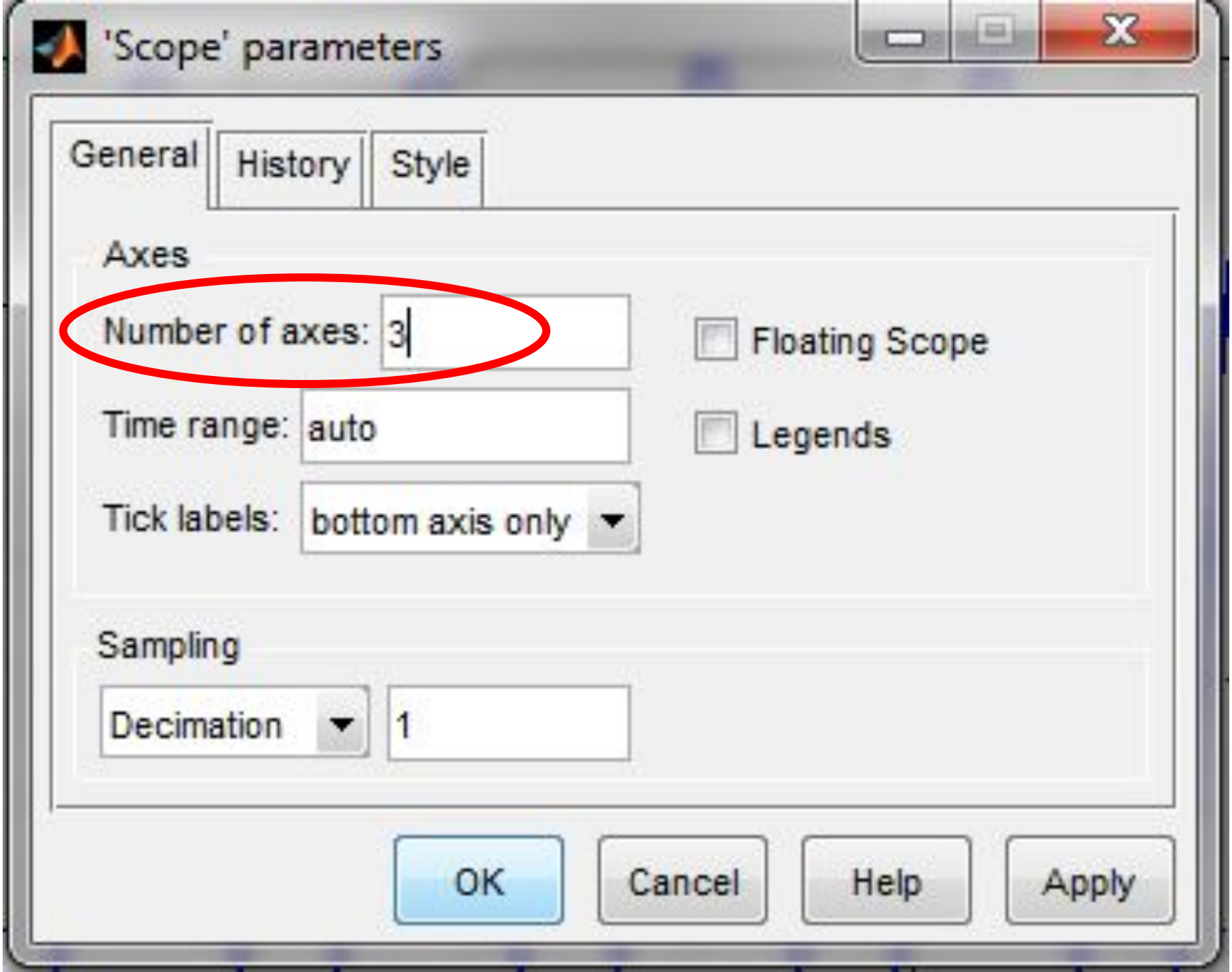
0.5

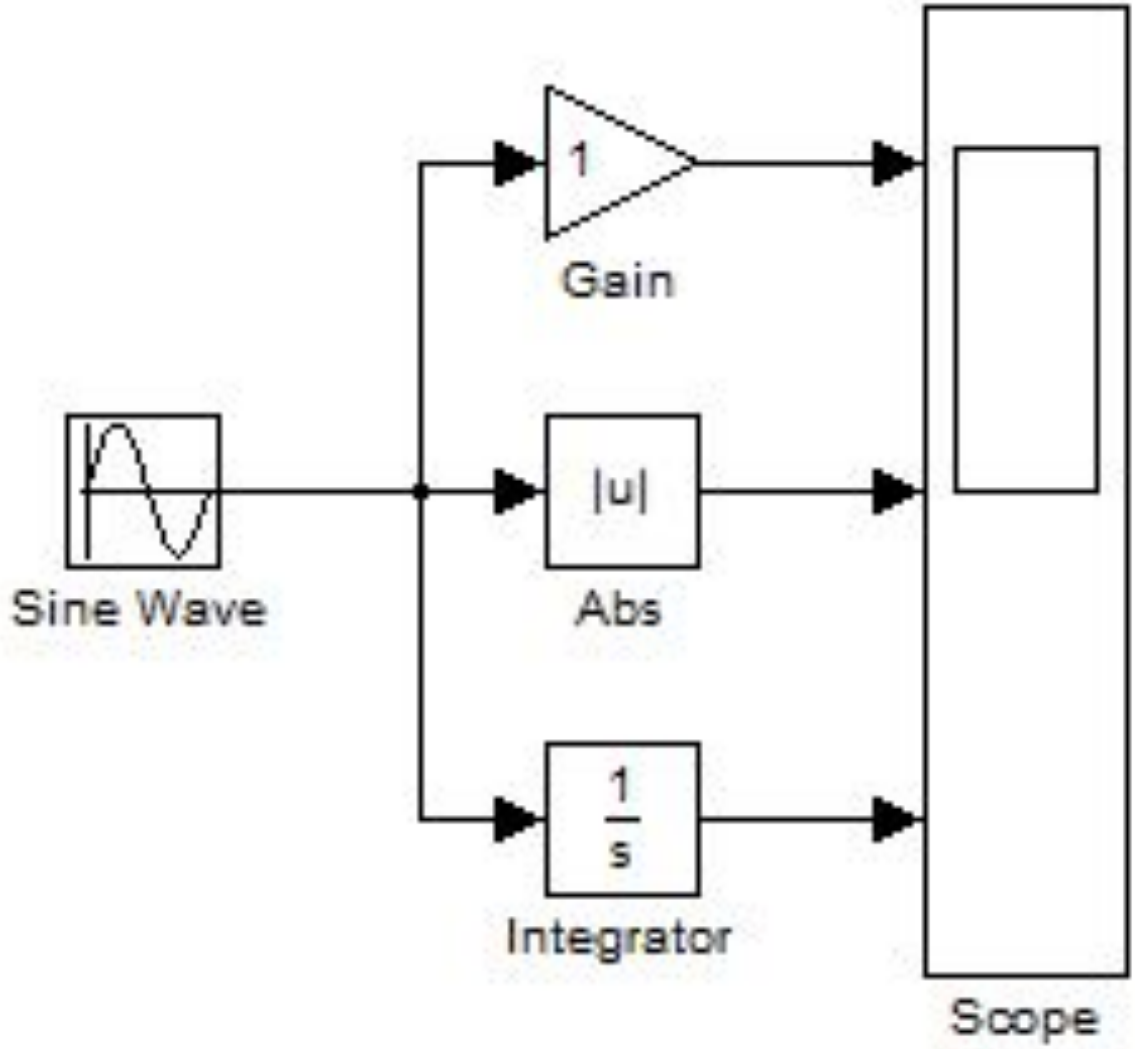

Sine Wave
Scope

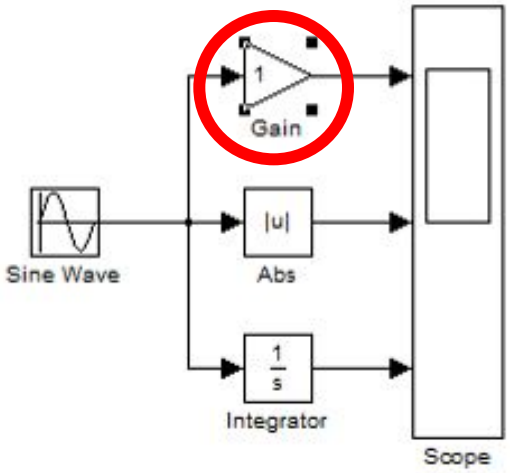

Scope
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
1.1
1.15
1.2
1.25
1.3
1.35
1.4
1.45
Time offset: 0

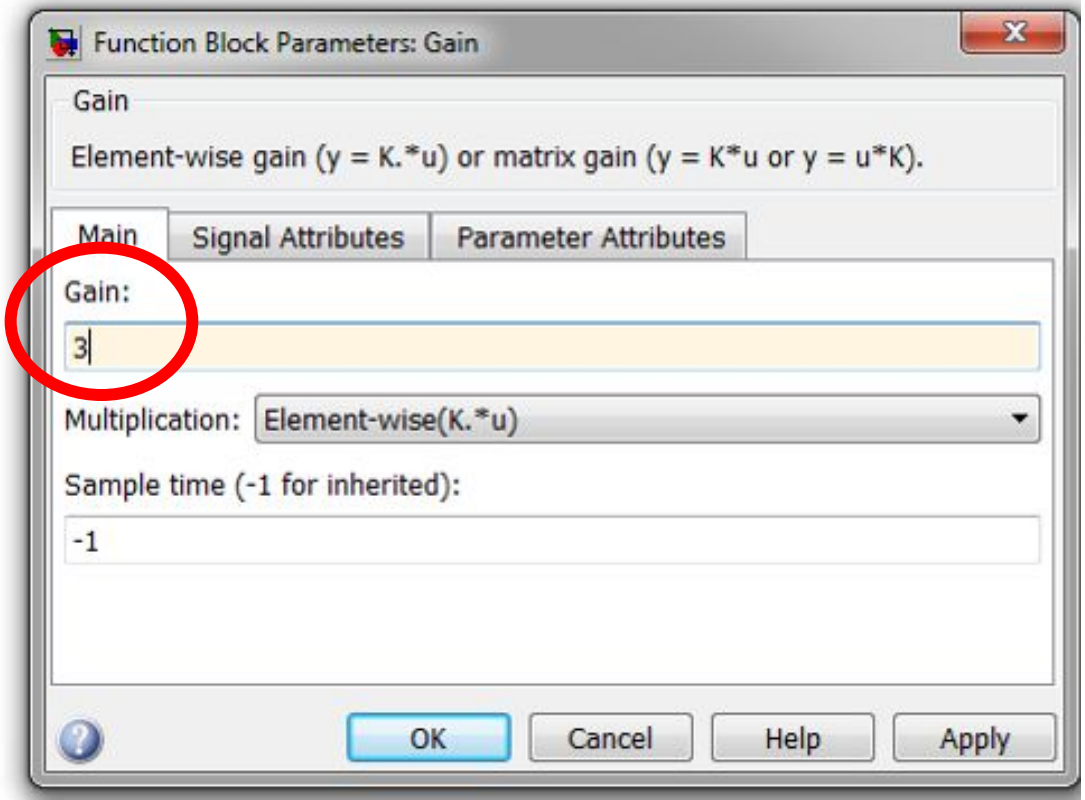

Scope
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
Time offset: 0

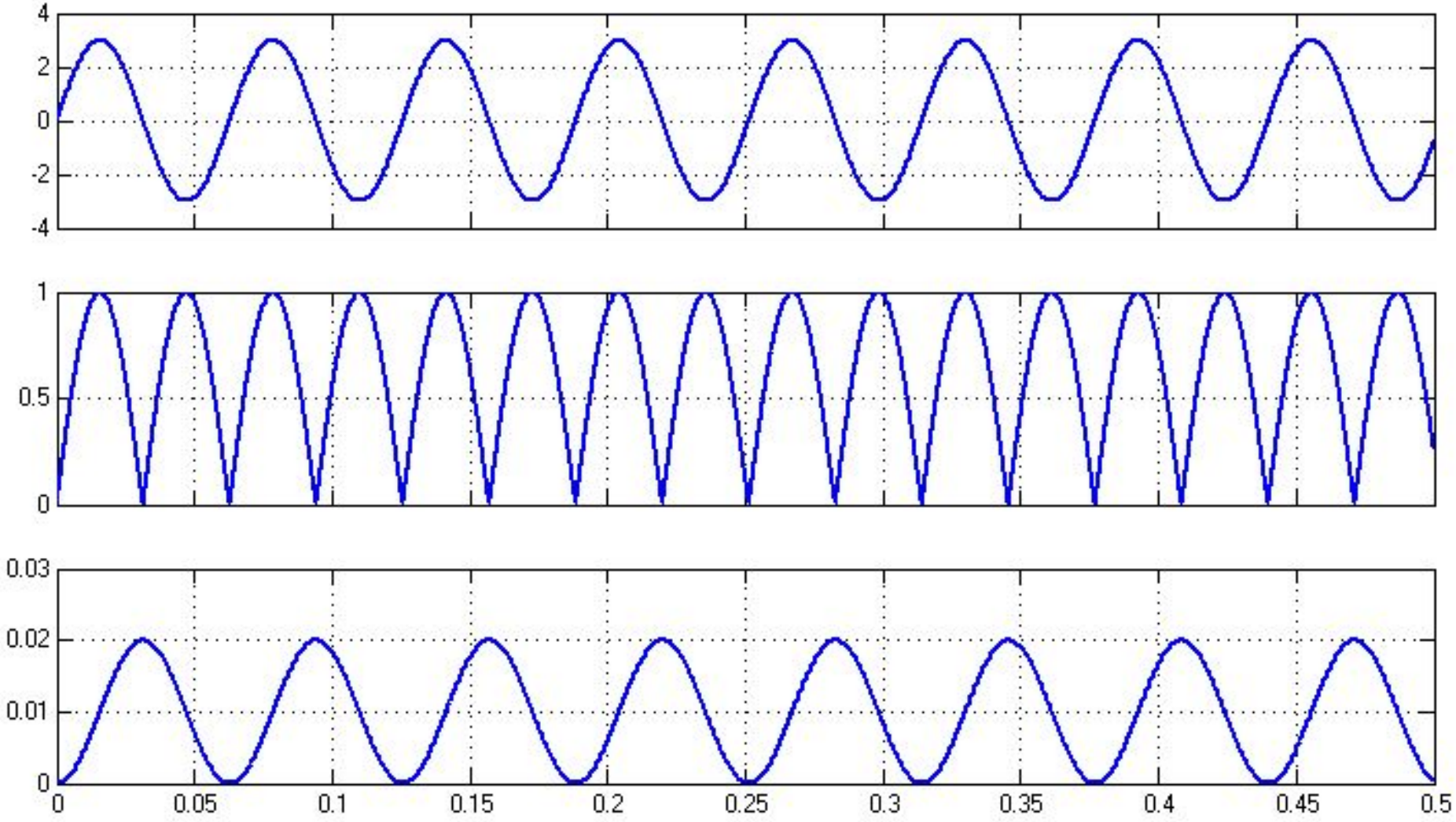

1
Gain
Sine Wave
|u|
Abs
Scope
1
s
Integrator

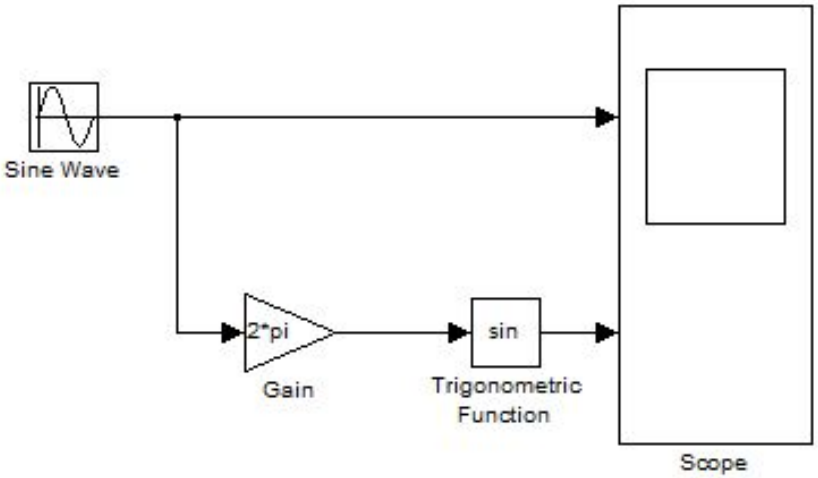

'Scope' parameters
General
History
Style
Axes
Number of axes: 3
Floating Scope
Time range: auto
Legends
Tick labels: bottom axis only
Sampling
Decimation
1
OK
Cancel
Help
Apply

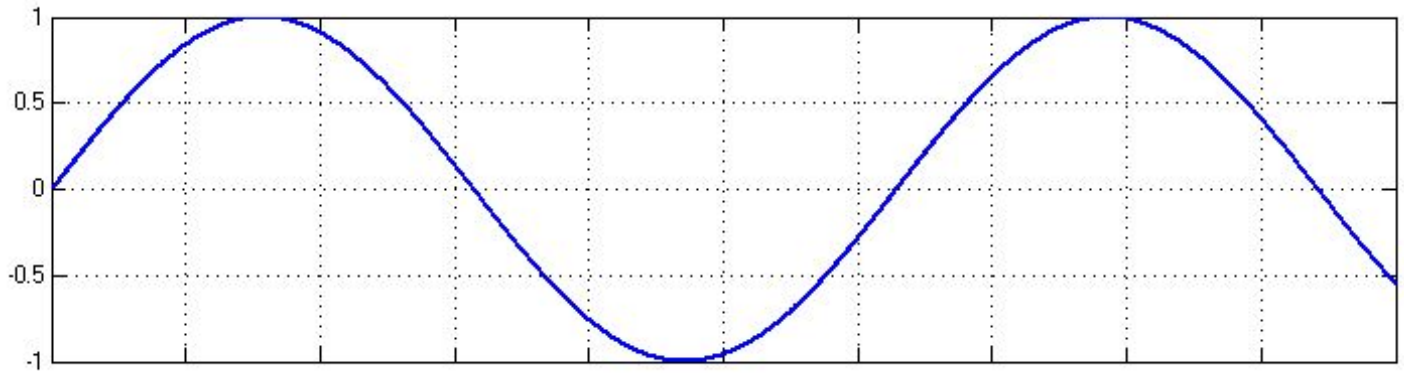

1
Gain
|u|
Abs
1
s
Integrator
Sine Wave
Scope

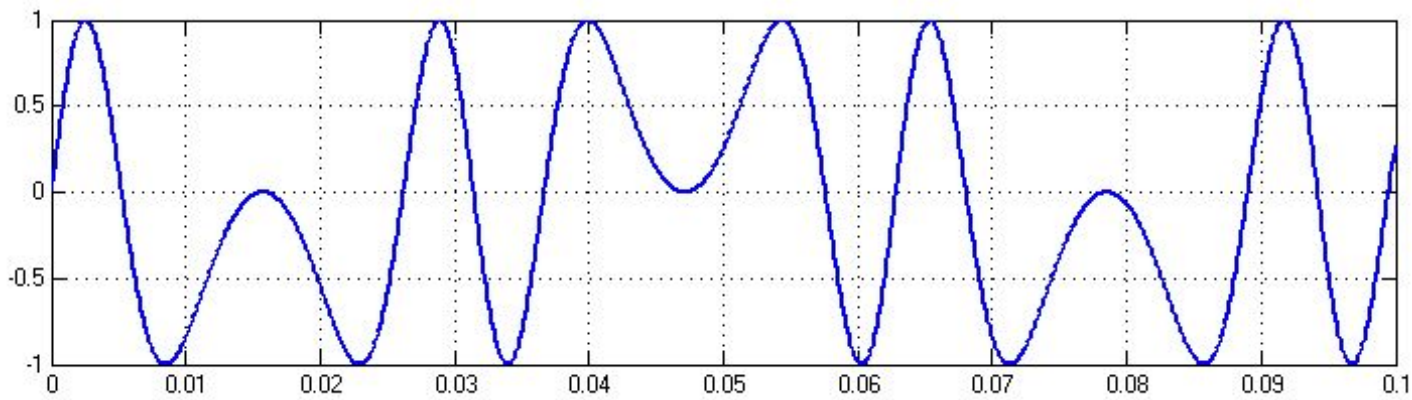

1
Gain
Sine Wave
|u|
Abs
1
s
Integrator
Scope

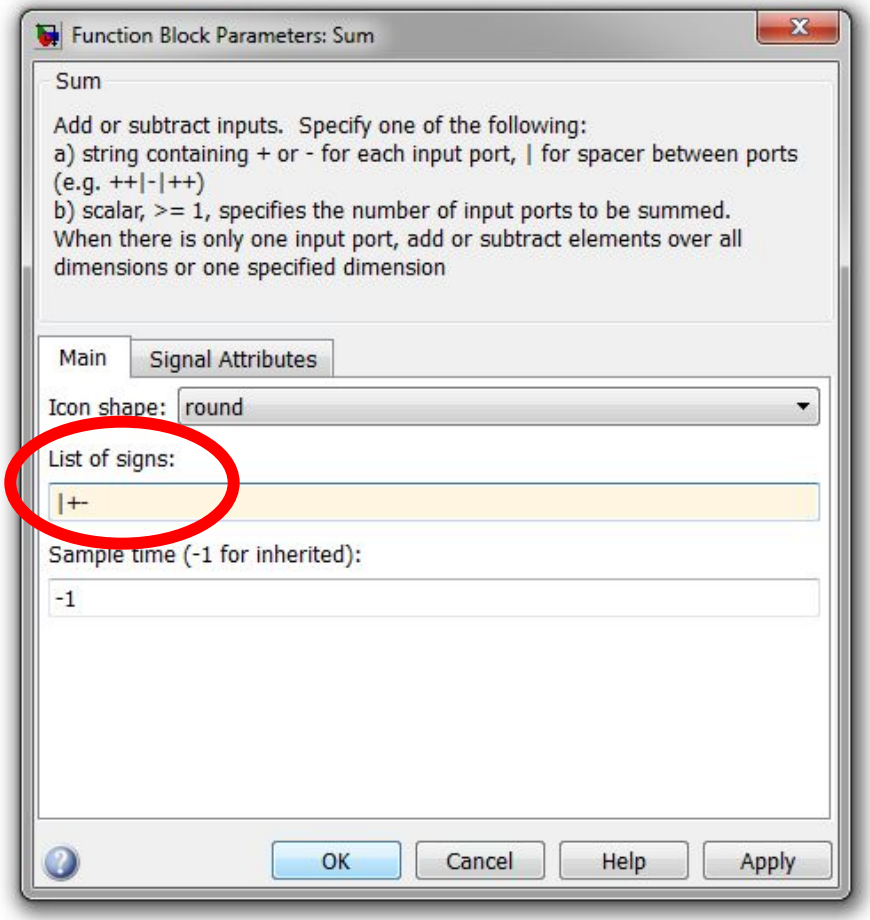

Function Block Parameters: Gain
Gain
Element-wise gain (y = K.*u) or matrix gain (y = K*u or y = u*K).
Main
Signal Attributes
Parameter Attributes
Gain:
3
Multiplication:
Element-wise(K.*u)
Sample time (-1 for inherited):
-1
OK
Cancel
Help
Apply

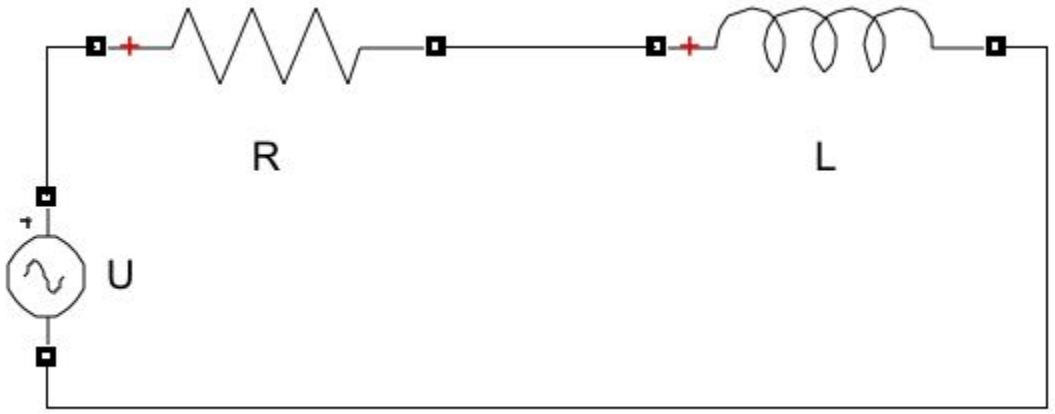

4
2
0
-2
-4
1
0.5
0
0.03
0.02
0.01
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5


Sine Wave
2*pi
Gain
sin
Trigonometric
Function
Scope


1
0.5
0
-0.5
-1


1
0.5
0
-0.5
-1
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1


Function Block Parameters: Sum
Sum
Add or subtract inputs. Specify one of the following:
a) string containing + or - for each input port, | for spacer between ports (e.g. ++|-|++)
b) scalar, >= 1, specifies the number of input ports to be summed.
When there is only one input port, add or subtract elements over all dimensions or one specified dimension
Main
Signal Attributes
Icon shape:
round
List of signs:
|+-
Sample time (-1 for inherited):
-1
OK
Cancel
Help
Apply



$$u(t) = e(t) + i(t) \cdot R$$

$$u(t) = e(t) + i(t) \cdot R$$

$$u(t) = e(t) + i(t) \cdot R$$

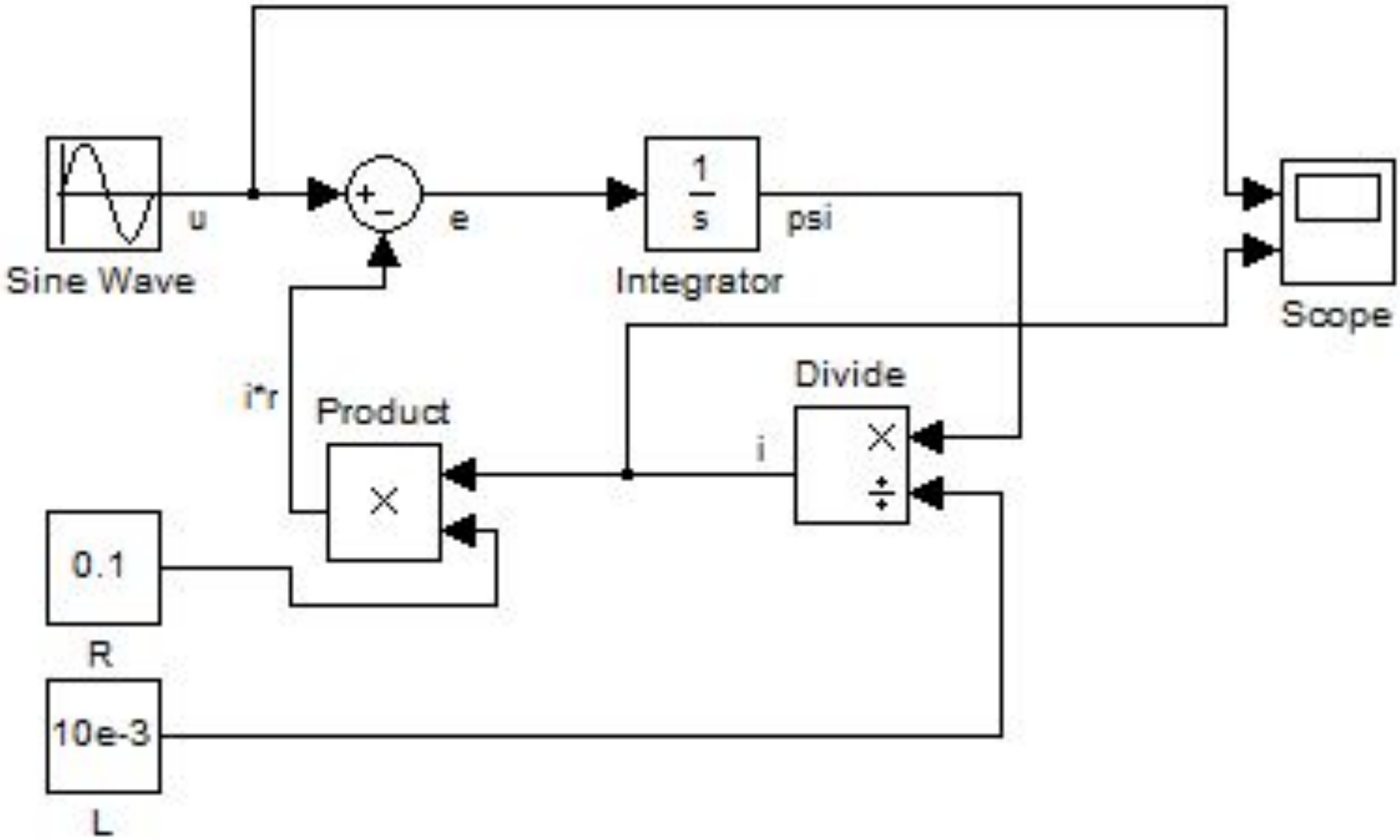
$$u(t) = e(t) + i(t) \cdot R$$

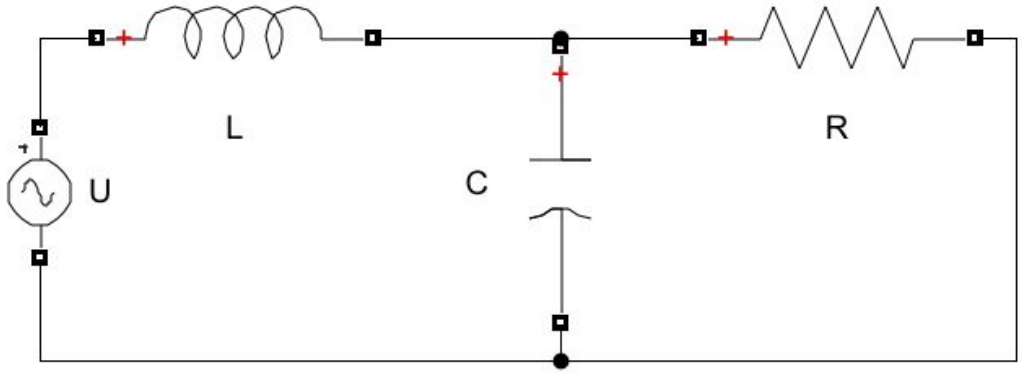
$$u(t) = e(t) + i(t) \cdot R$$

$$u(t) = e(t) + i(t) \cdot R$$

$$u(t) = e(t) + i(t) \cdot R$$

$$u(t) = e(t) + i(t) \cdot R$$


u
Sine Wave
e
1
s
psi
Integrator
Scope
i*r
Product
Divide
i
0.1
R
10e-3
L



$$u(t) = e(t) + i(t) \cdot R$$

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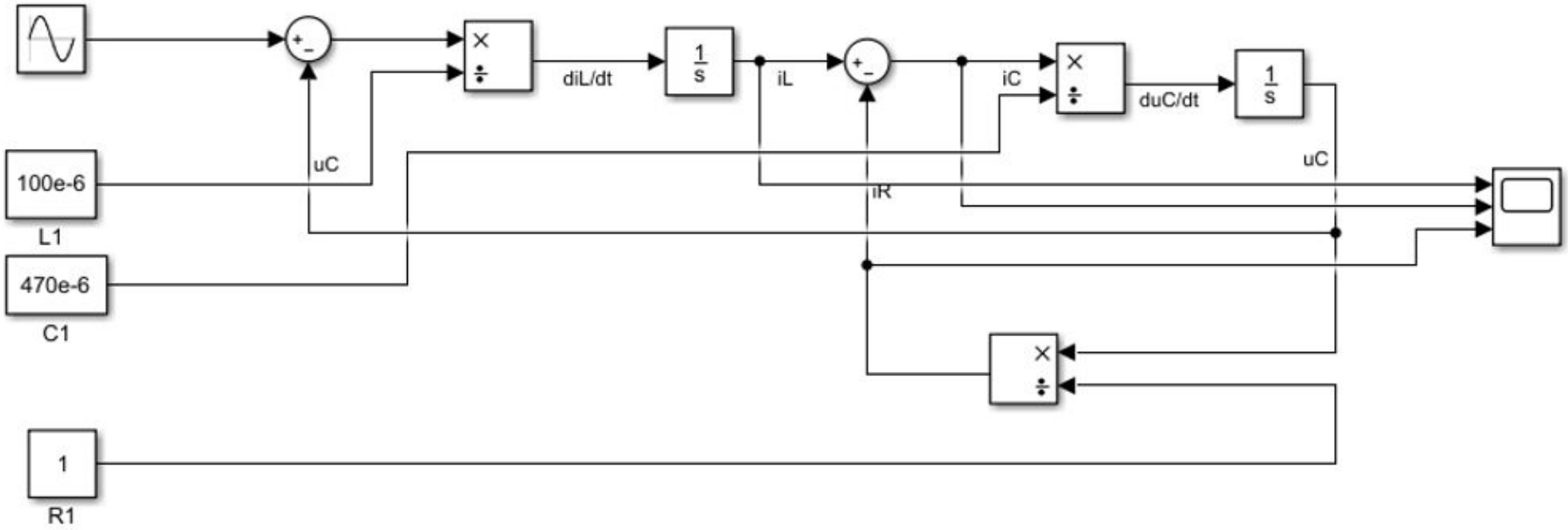
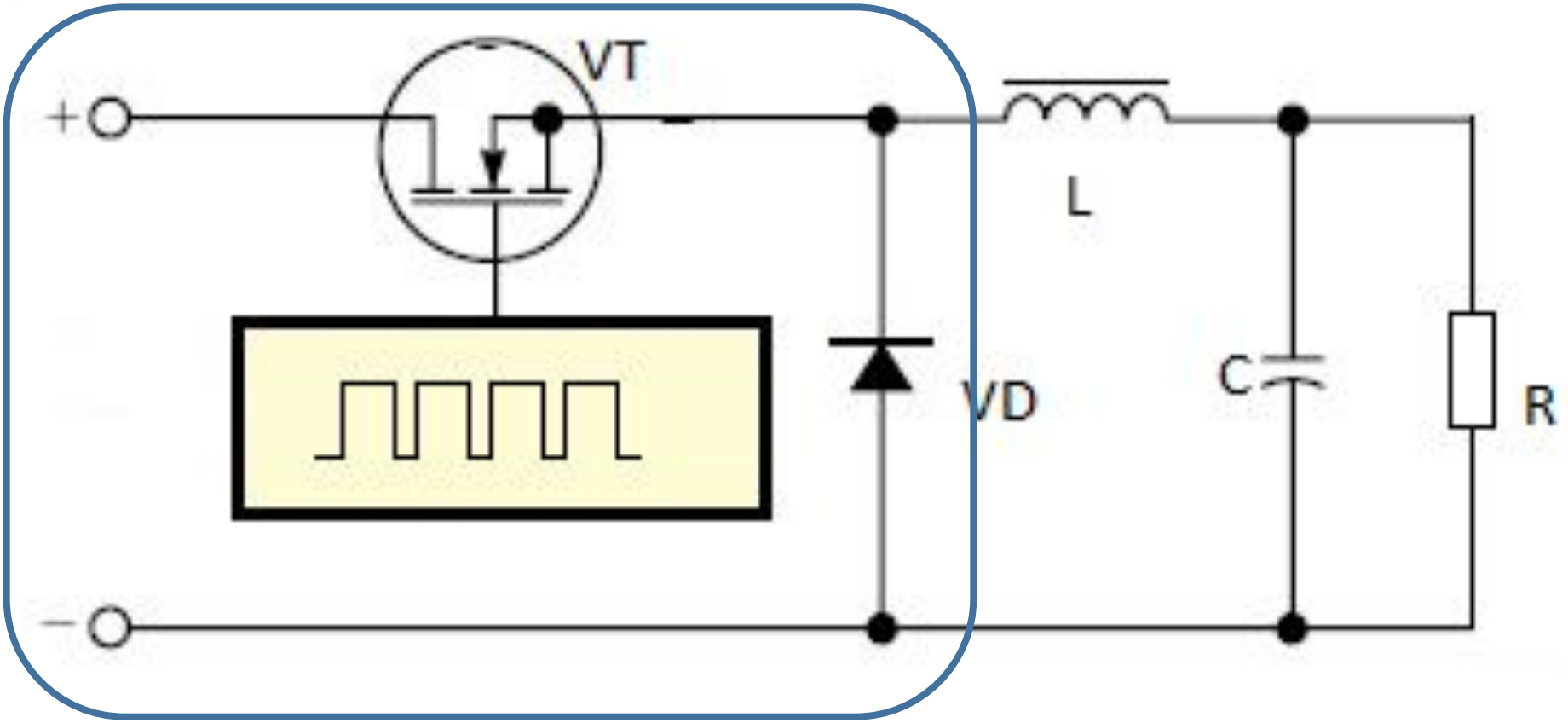

diL/dt
1
s
iL
iC
duC/dt
1
s
uC
uC
100e-6
L1
iR
470e-6
C1
1
R1


VT
+
−
L
VD
C
R

Pulse
Generator1

Source Block Parameters: Pulse Generator1

Pulse Generator

Output pulses:

```
if (t >= PhaseDelay) && Pulse is on
  Y(t) = Amplitude
else
  Y(t) = 0
end
```

Pulse type determines the computational technique used.

Time-based is recommended for use with a variable step solver, while Sample-based is recommended for use with a fixed step solver or within a discrete portion of a model using a variable step solver.

Parameters

Pulse type: Time based

Time (t): Use simulation time

Amplitude:

50

Period (secs):

5e-4

Pulse Width (% of period):

50

Phase delay (secs):

0

Interpret vector parameters as 1-D

OK Cancel Help Apply

№ вар.	1	2	3	4	5	6
U_{in}, В	30	40	50	30	40	50
f, Гц	350	300	250	250	300	350
$R_н$, Ом	3.3	3.9	4.7	5.6	6.8	8.2

№ вар.	7	8	9	10	11	12	13	14	15
U_{in}, В	60	70	80	60	70	80	90	100	110
f, Гц	350	300	250	250	300	350	350	300	250
$R_н$, Ом	3.3	3.9	4.7	5.6	6.8	8.2	5.6	6.8	8.2

U_{in} – входное напряжение регулятора; f – частота переключения ключа;
R – сопротивление нагрузки

Для всех вариантов D = 0,5

$$L \geq \frac{R_н}{2f}(1 - D_{\min}).$$

D_{min} – минимальное значение коэффициента заполнения равное 0,1

$$2\pi \cdot f \cdot C_{out} R_н >> 1.$$