自动控制理论 B

Matlab 仿真实验报告

实 验 名 称	：相平面分析
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撰 写 日 期	：2020.6.25

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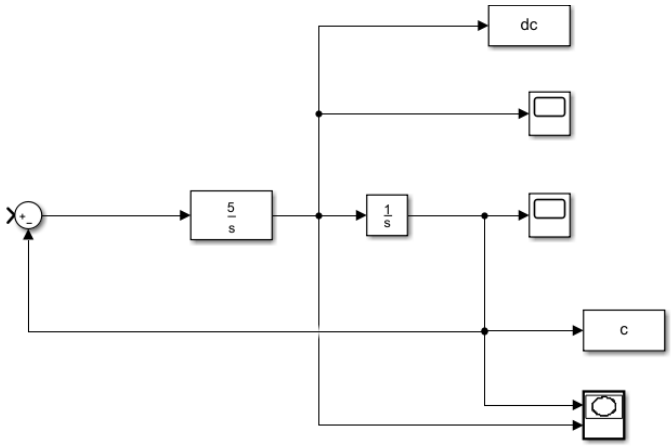
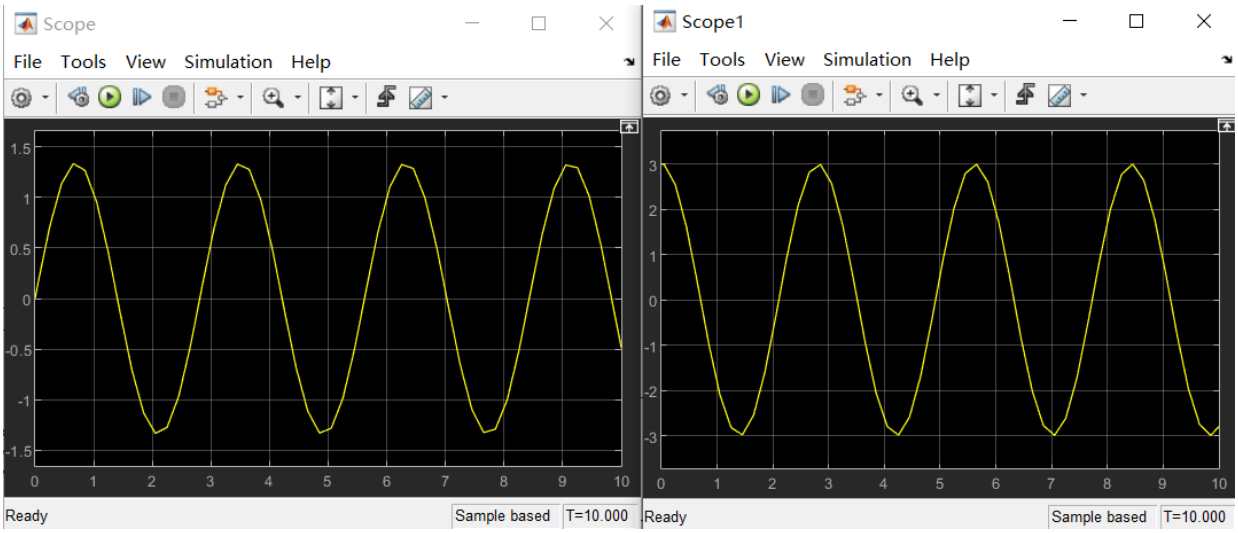
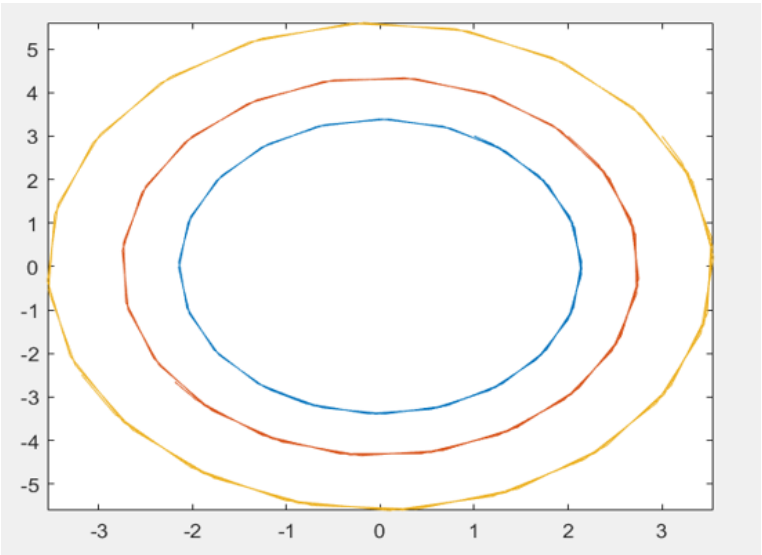
一、 线性系统的相平面图

此部分内容需要自己设置参数、搭建仿真图、时间响应曲线、相平面图。对于奇点为节点和鞍点的情形，要画出特殊等倾线对应的相轨迹。

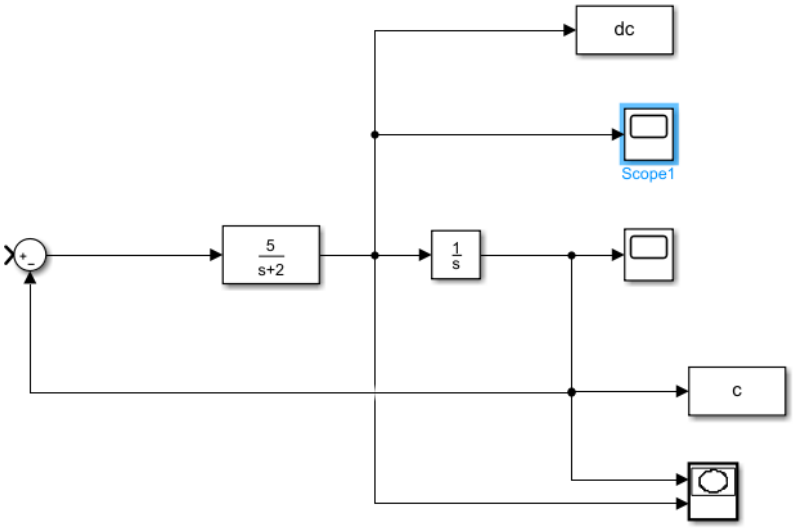
1. 中心点

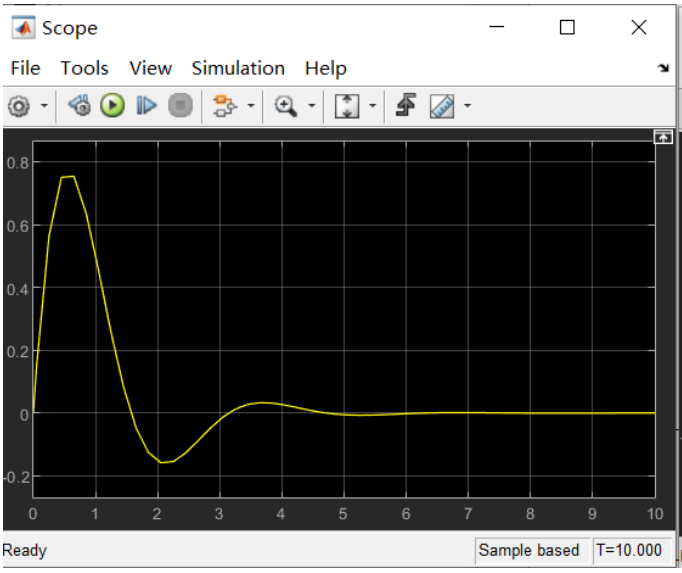


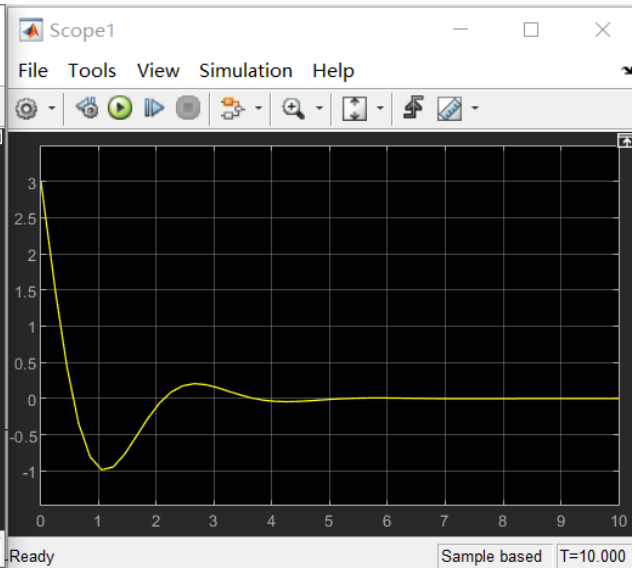




2. 稳定焦点


dc
Scope1
5
s+2
1
s
c


Scope
File Tools View Simulation Help
0.8
0.6
0.4
0.2
0
-0.2
0 1 2 3 4 5 6 7 8 9 10
Ready
Sample based
T=10.000


Scope1
File Tools View Simulation Help
3
2.5
2
1.5
1
0.5
0
-0.5
-1
0 1 2 3 4 5 6 7 8 9 10
Ready
Sample based
T=10.000

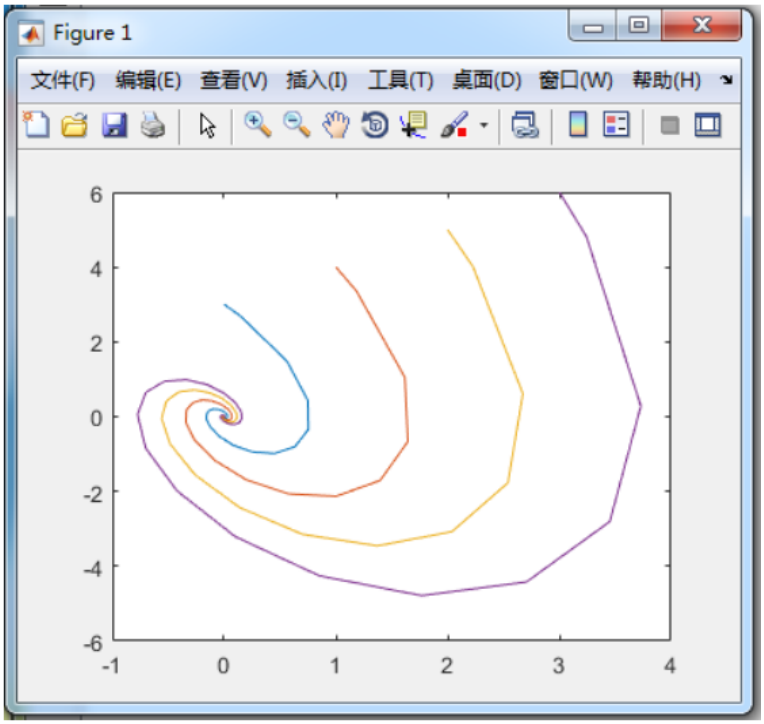
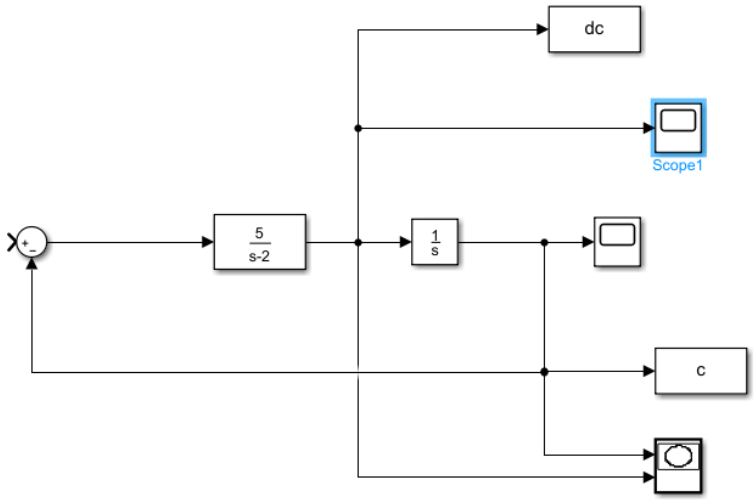
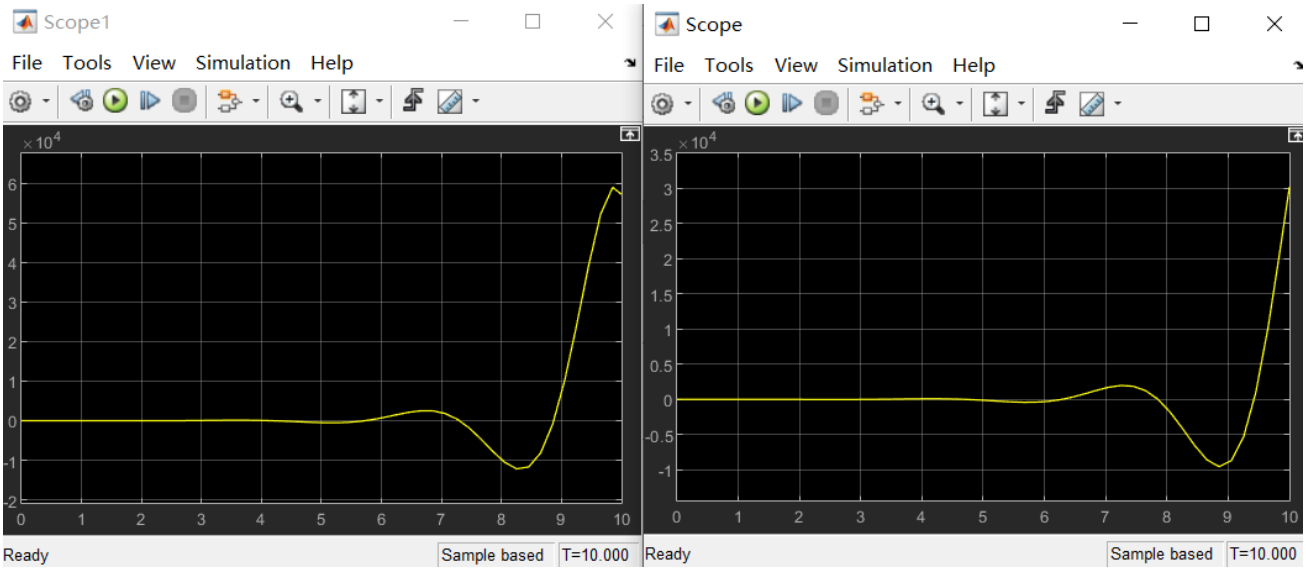
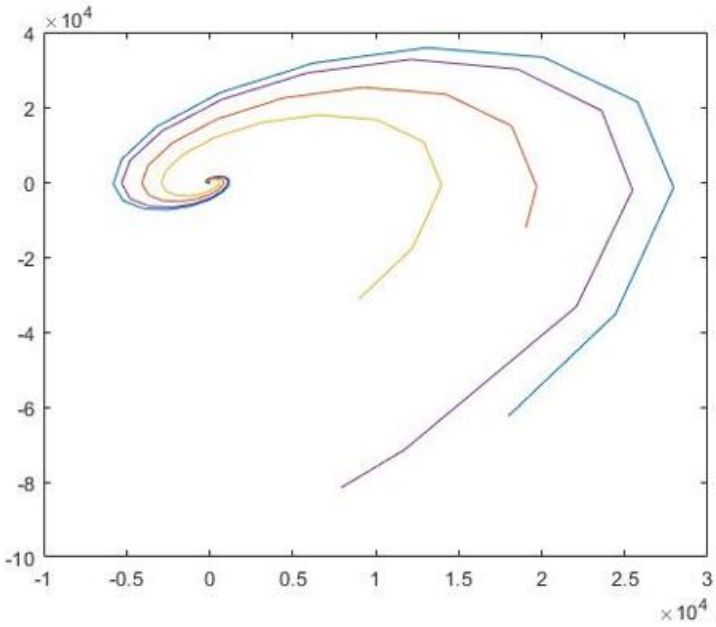


Figure 1
文件(F) 编辑(E) 查看(V) 插入(I) 工具(T) 桌面(D) 窗口(W) 帮助(H)
6
4
2
0
-2
-4
-6
-1 0 1 2 3 4

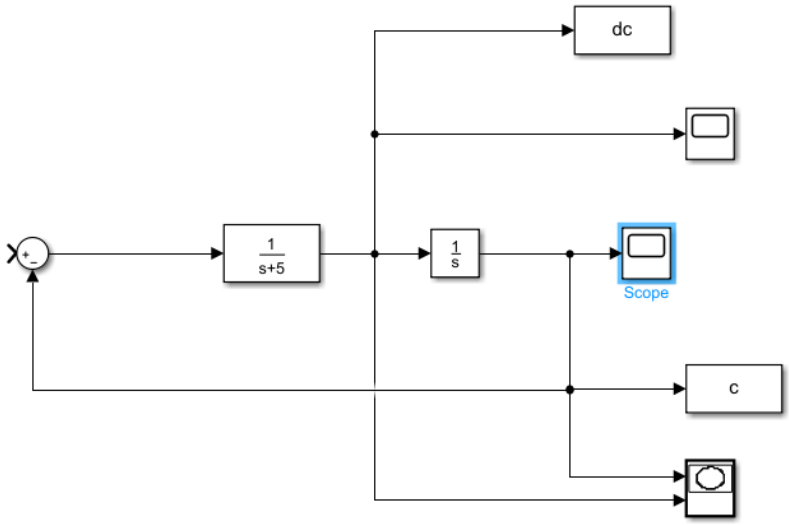
3. 不稳定焦点

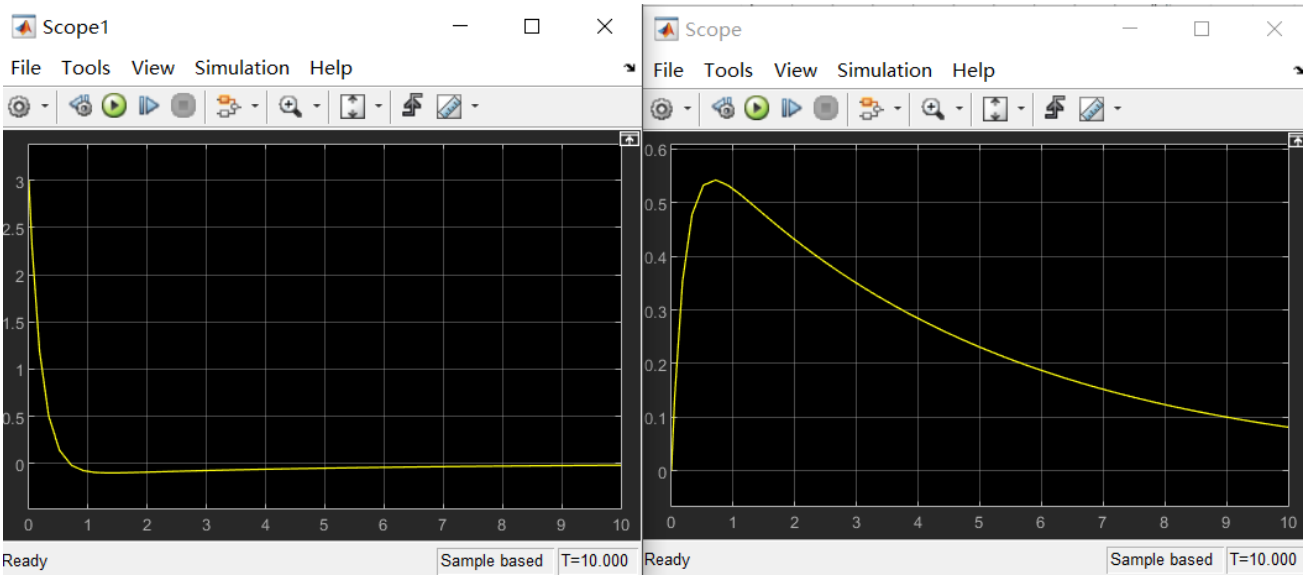

dc
Scope1
5
s-2
1
s
c

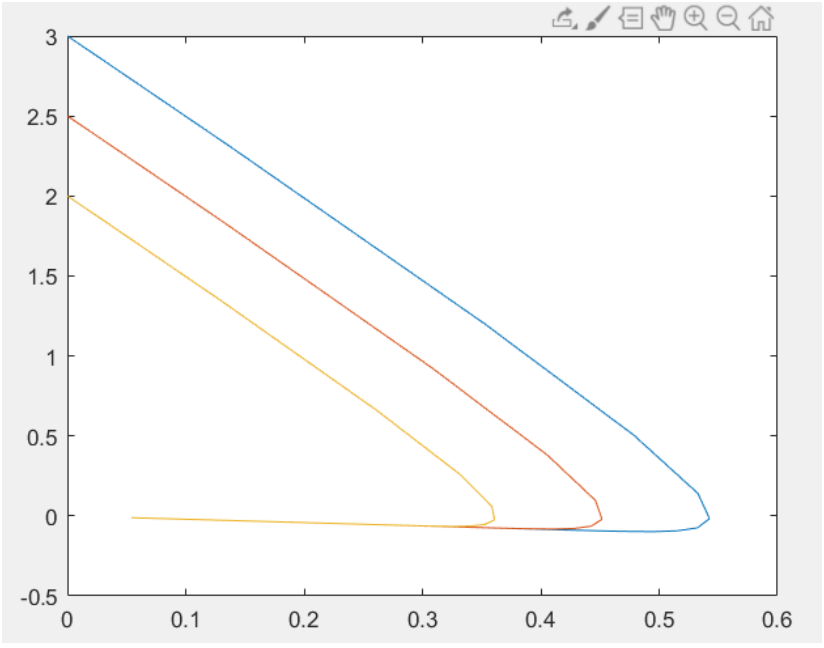

Scope1
File Tools View Simulation Help
Ready
Sample based
T=10.000
Scope
File Tools View Simulation Help
Ready
Sample based
T=10.000



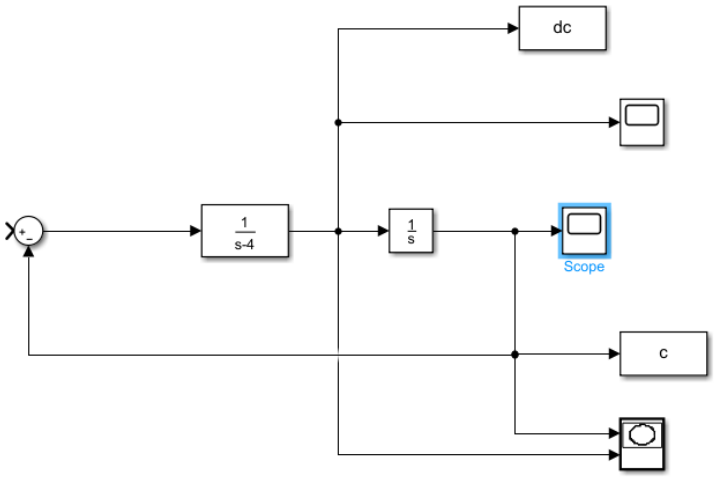
4. 稳定节点

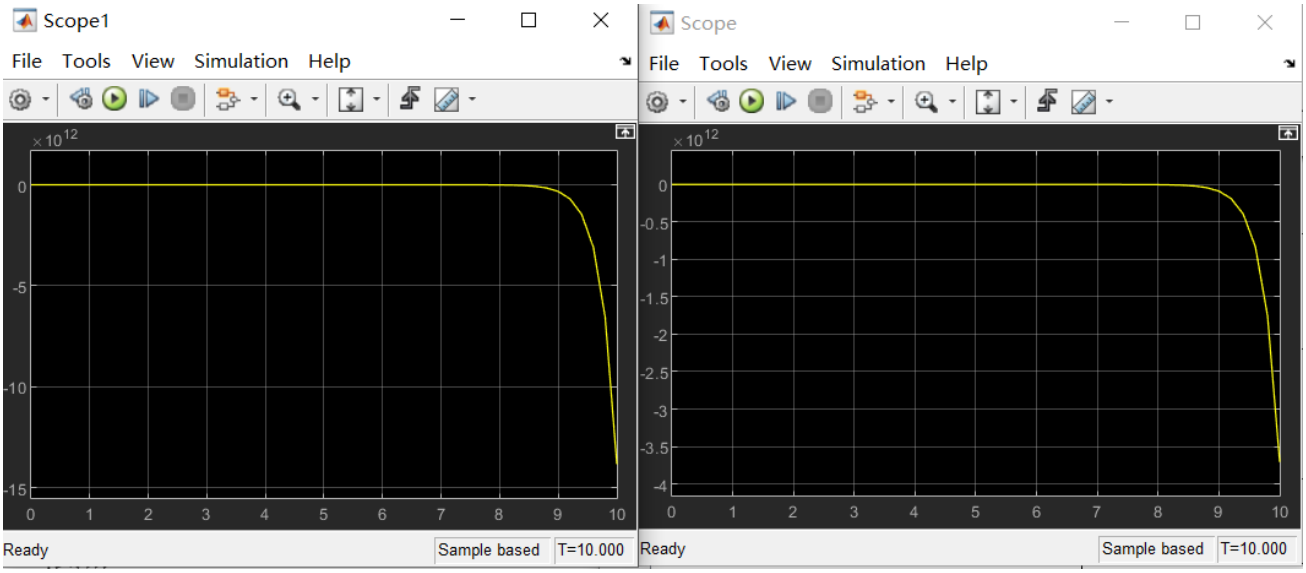

dc
1
s+5
1
s
Scope
c


Scope1
File Tools View Simulation Help
Ready
Sample based
T=10.000
Scope
File Tools View Simulation Help
Ready
Sample based
T=10.000

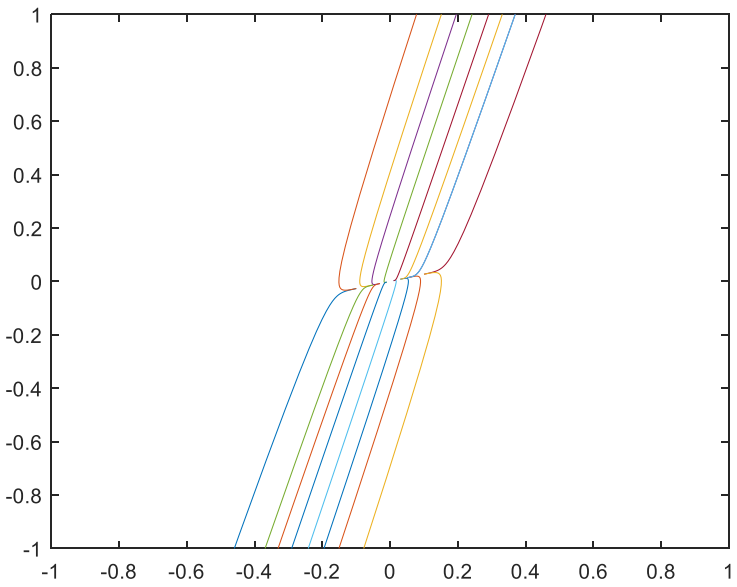

3
2.5
2
1.5
1
0.5
0
-0.5
0
0.1
0.2
0.3
0.4
0.5
0.6

5. 不稳定节点

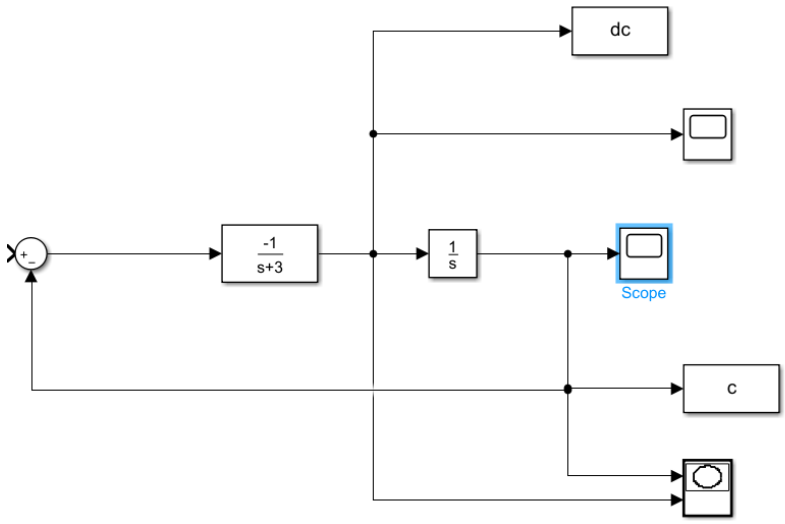


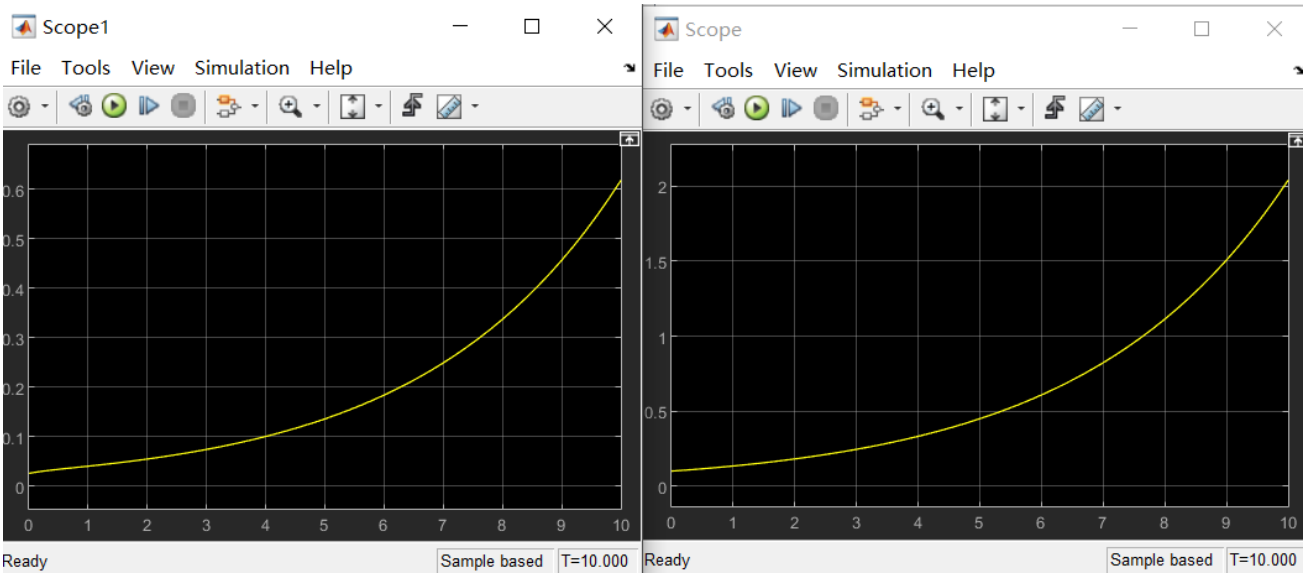


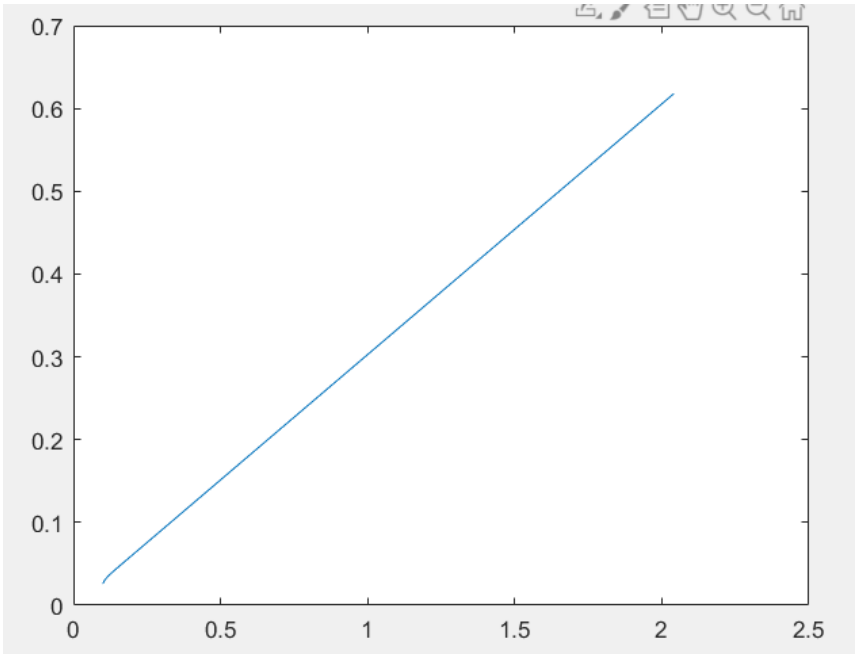
上述输出曲线为初值（0.1，0.026）对应的情形。



6. 鞍点


dc
-1
s+3
1
s
Scope
c

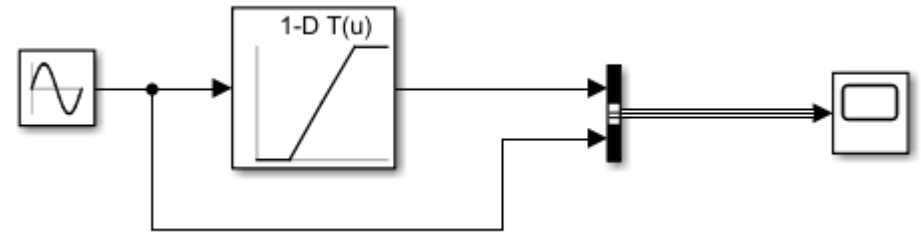

Scope1
File Tools View Simulation Help
Ready
Sample based
T=10.000
Scope
File Tools View Simulation Help
Ready
Sample based
T=10.000

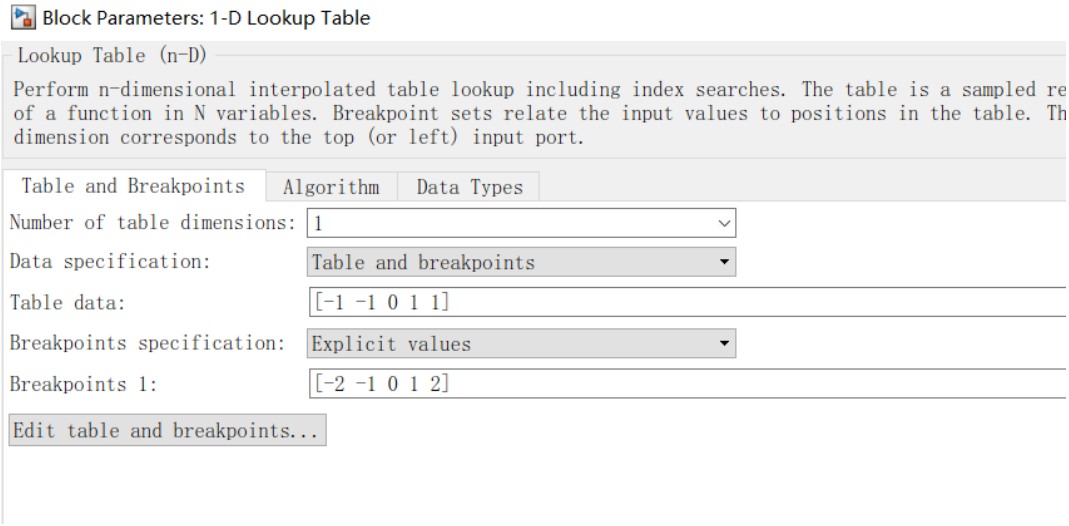

0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.5
1
1.5
2
2.5

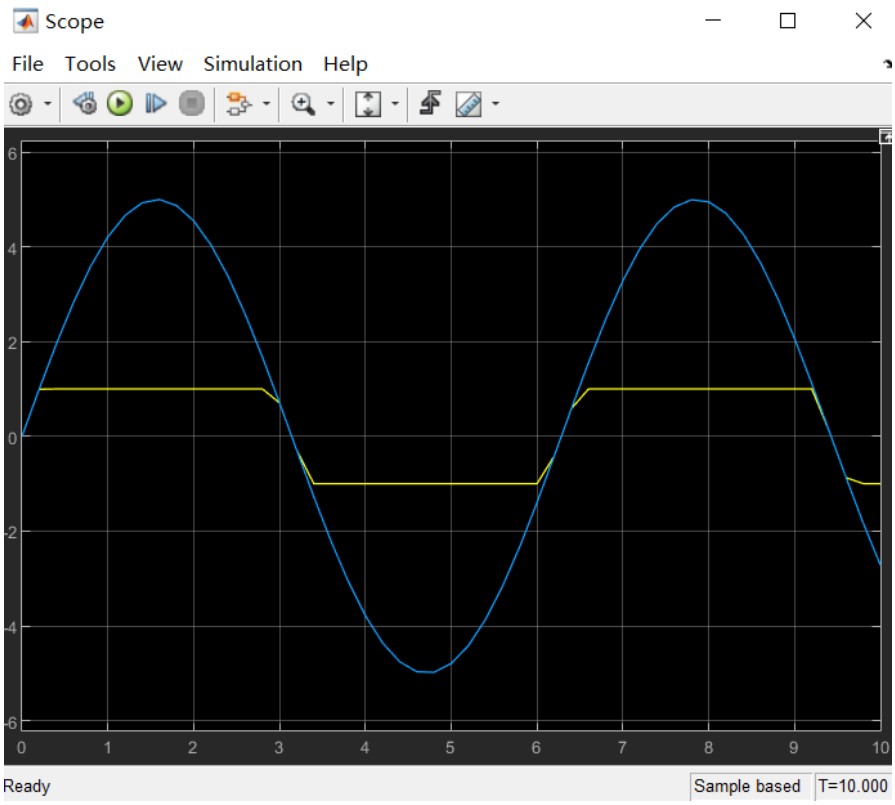
二、 非线性环节的 Lookup tables 表示方法

此部分内容需要截图 Lookup table 的参数设置界面、画出输入为正弦信号时的输出响应（在同一个图里画出输入输出曲线）。

1. 饱和特性







2. 死区特性

Lookup Table (n-D)

Perform n-dimensional interpolated table lookup including index searches. Th
of a function in N variables. Breakpoint sets relate the input values to pos
dimension corresponds to the top (or left) input port.

Table and Breakpoints | Algorithm | Data Types

Number of table dimensions: 1

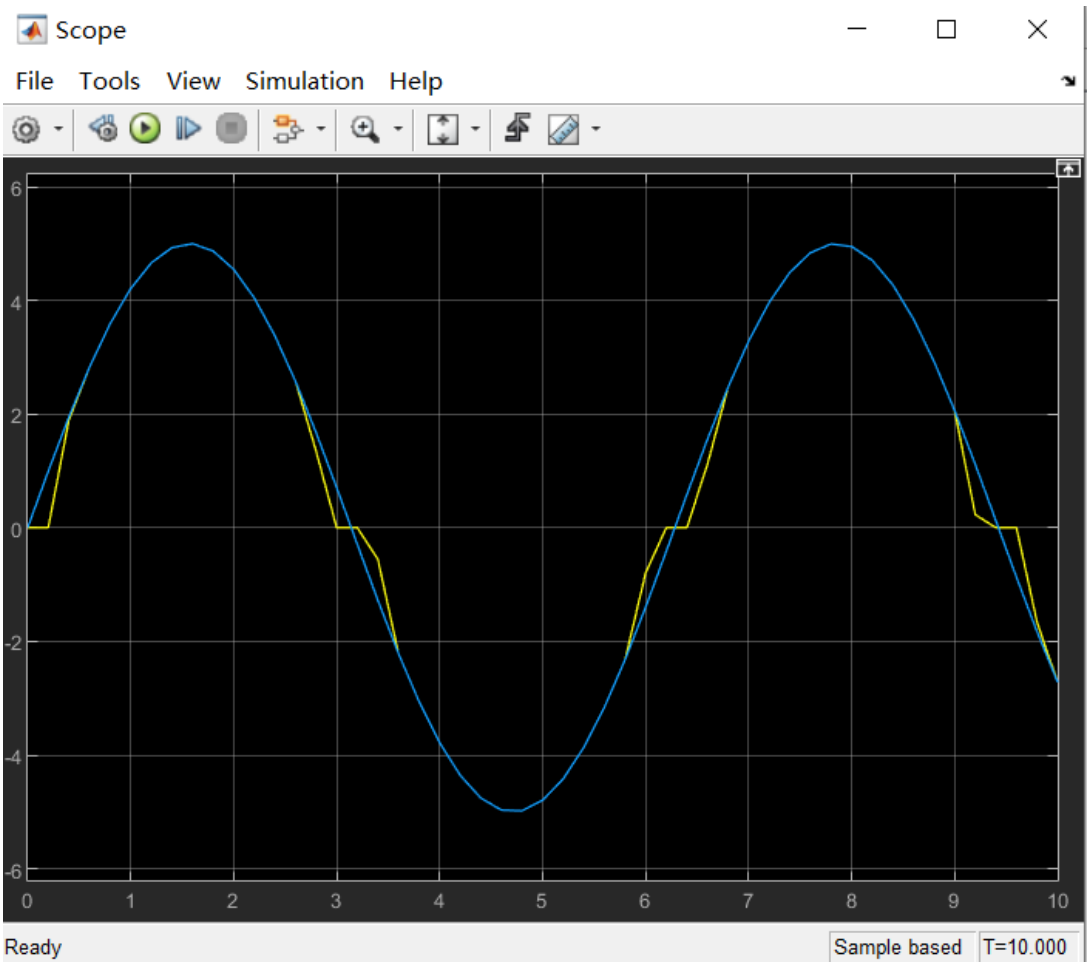
Data specification: Table and breakpoints

Table data: [-4 -3 -2 0 0 0 2 3 4]

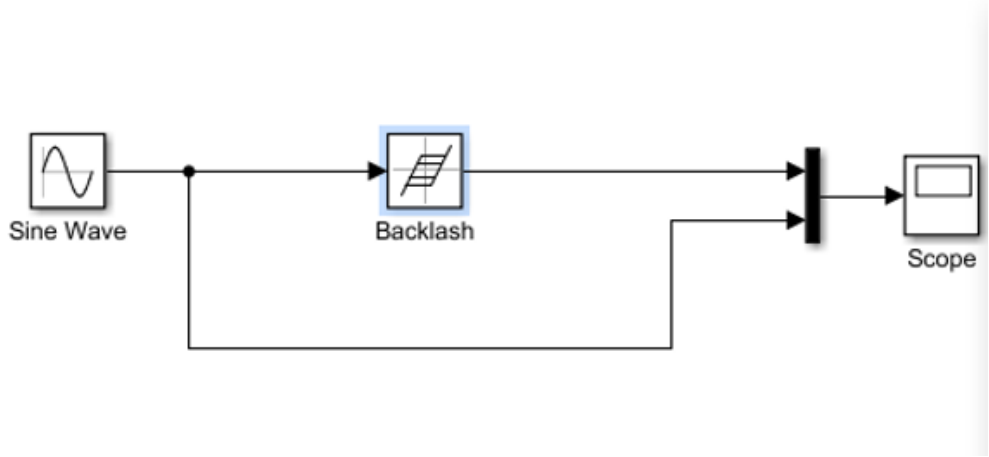
Breakpoints specification: Explicit values

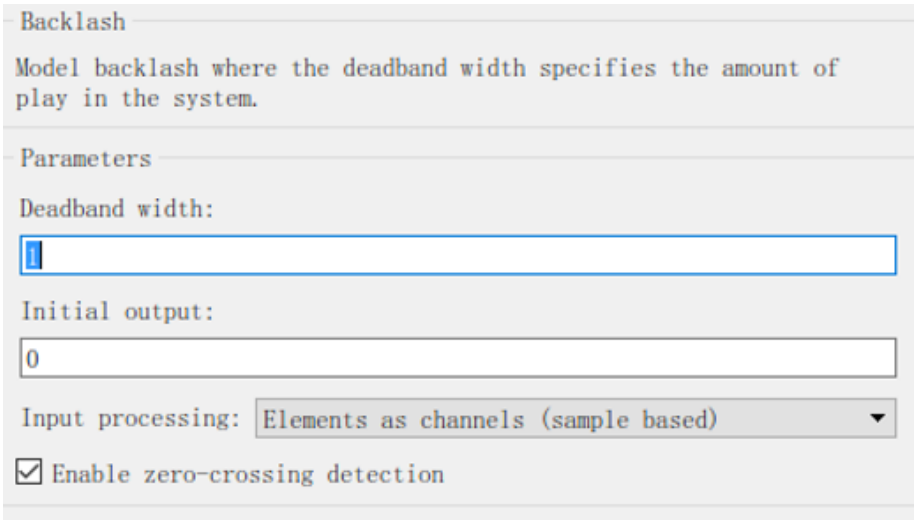
Breakpoints 1: [-4 -3 -2 -1 0 1 2 3 4]

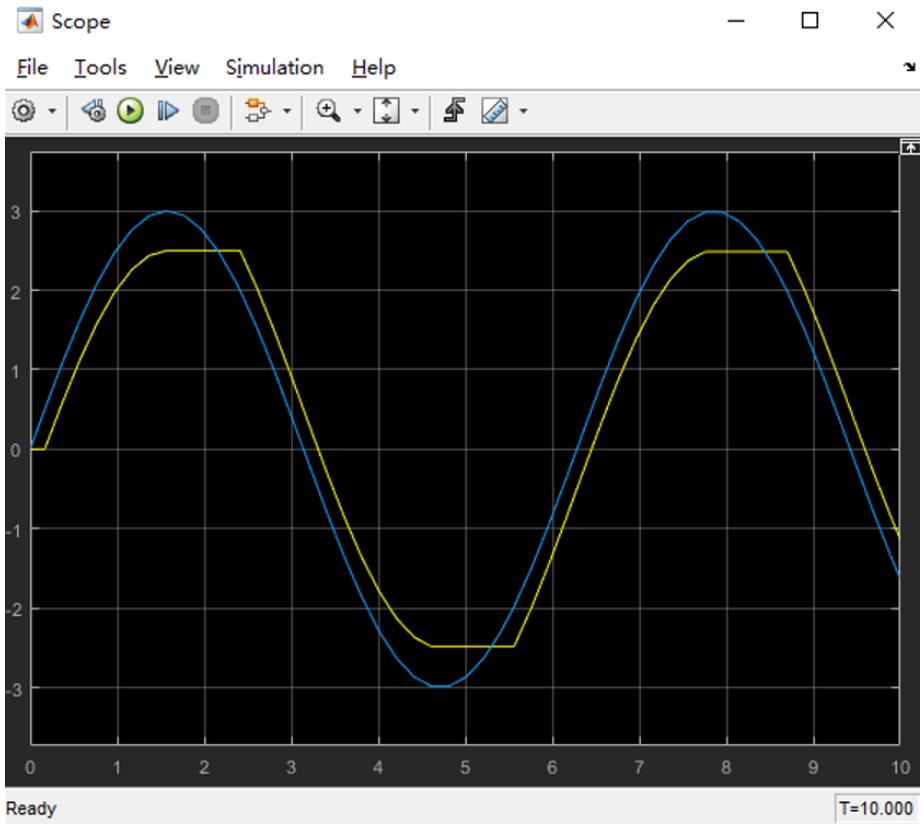
Edit table and breakpoints...



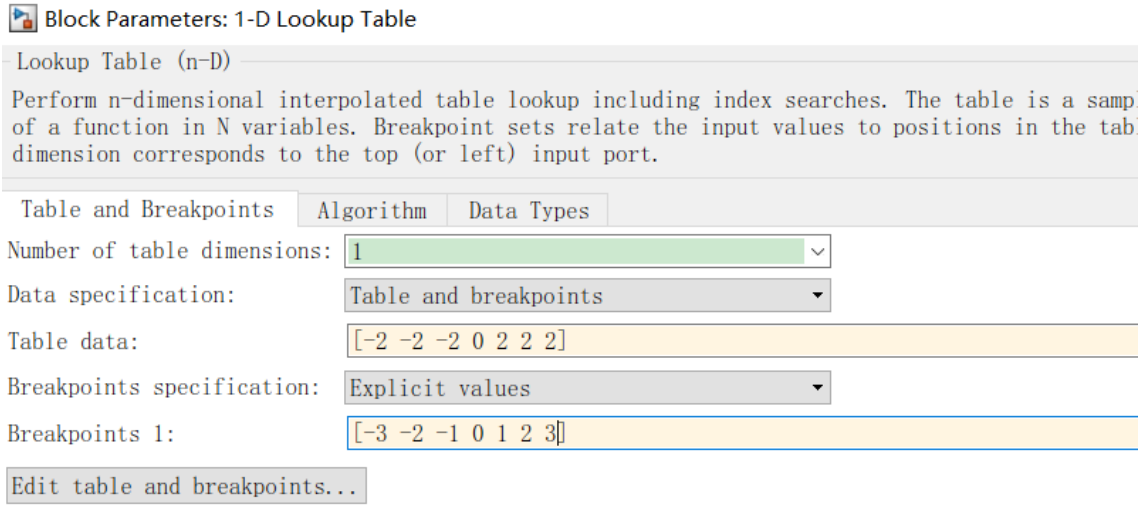
3. 滞环特性

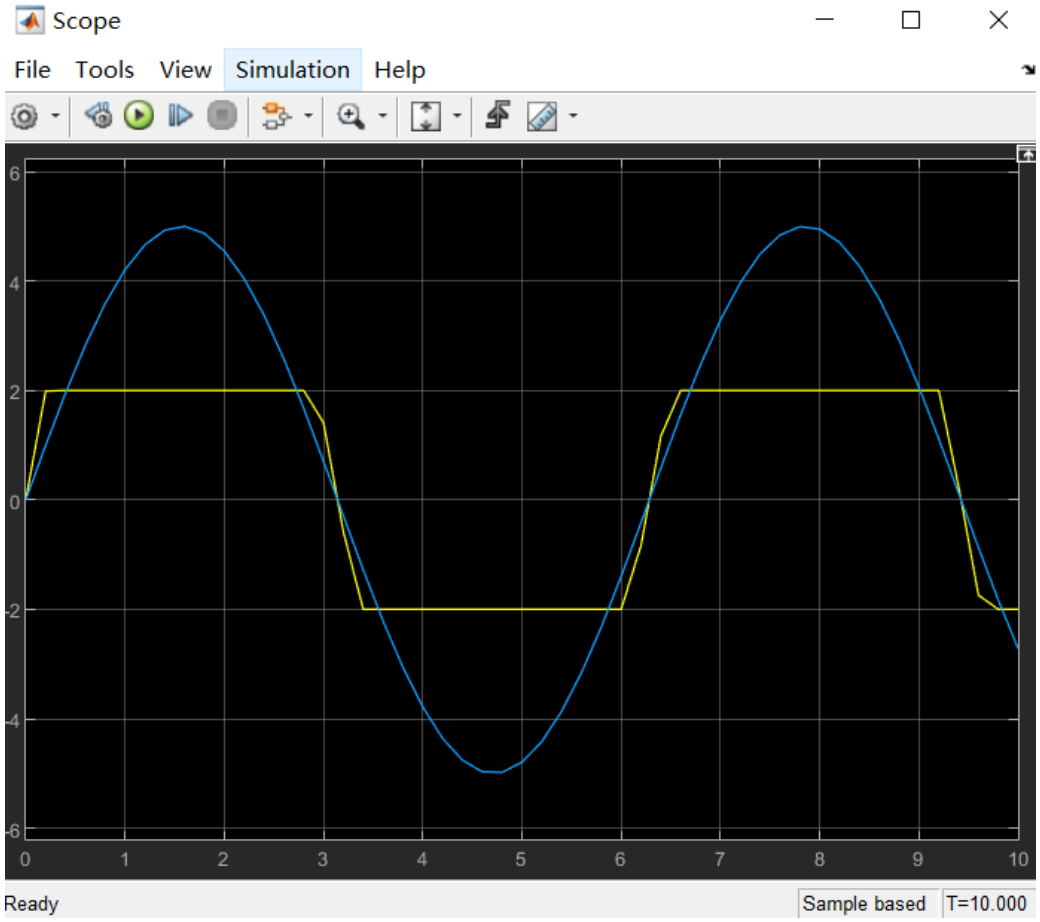

Sine Wave
Backlash
Scope


Backlash
Model backlash where the deadband width specifies the amount of play in the system.
Parameters
Deadband width:
1
Initial output:
0
Input processing:
Elements as channels (sample based)
Enable zero-crossing detection

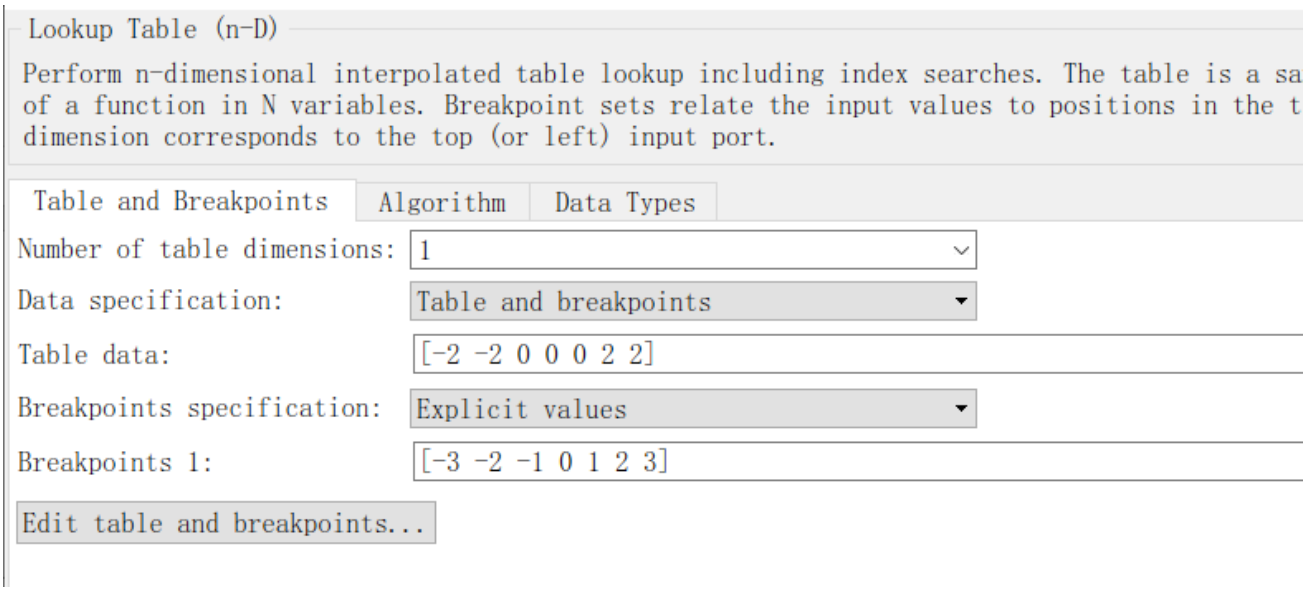

Scope
File
Tools
View
Simulation
Help
3
2
1
0
-1
-2
-3
0
1
2
3
4
5
6
7
8
9
10
Ready
T=10.000

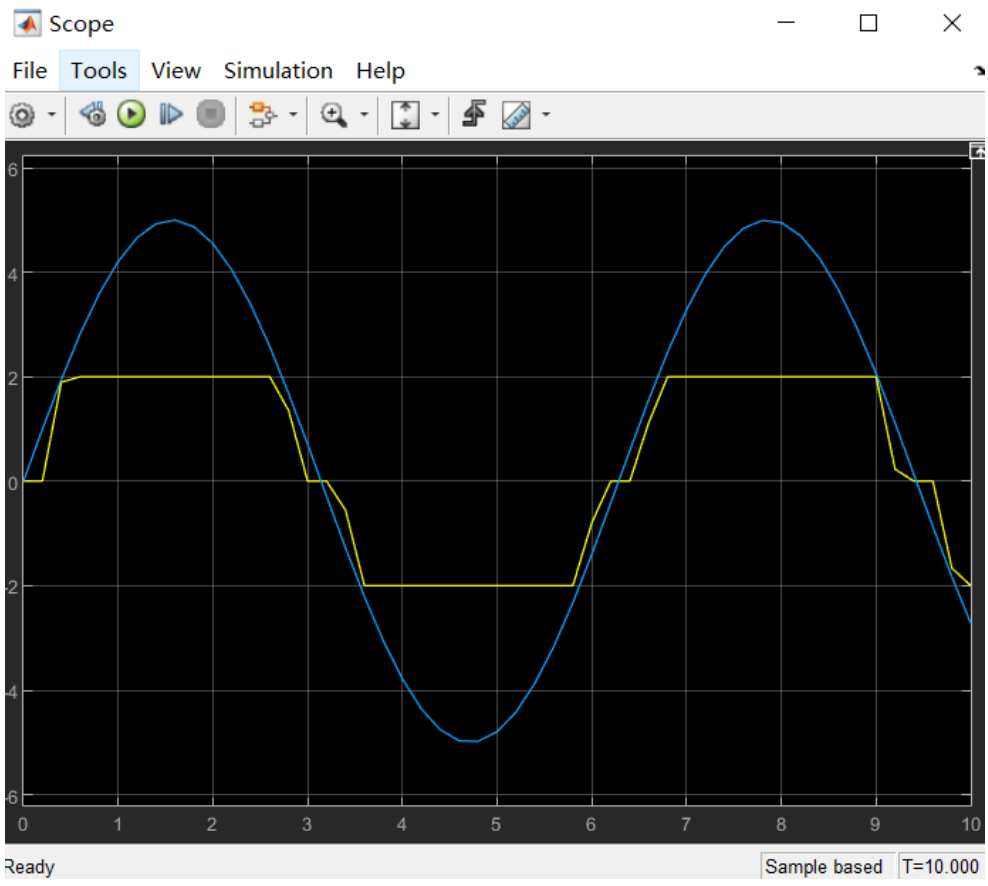
4. 理想继电特性


Block Parameters: 1-D Lookup Table
Lookup Table (n-D)
Perform n-dimensional interpolated table lookup including index searches. The table is a samp
of a function in N variables. Breakpoint sets relate the input values to positions in the tab
dimension corresponds to the top (or left) input port.
Table and Breakpoints
Algorithm
Data Types
Number of table dimensions:
1
Data specification:
Table and breakpoints
Table data:
[-2 -2 -2 0 2 2 2]
Breakpoints specification:
Explicit values
Breakpoints 1:
[-3 -2 -1 0 1 2 3]
Edit table and breakpoints...


Scope
File
Tools
View
Simulation
Help
6
4
2
0
-2
-4
-6
0
1
2
3
4
5
6
7
8
9
10
Ready
Sample based
T=10.000

5. 死区继电特性


Lookup Table (n-D)
Perform n-dimensional interpolated table lookup including index searches. The table is a sa
of a function in N variables. Breakpoint sets relate the input values to positions in the t
dimension corresponds to the top (or left) input port.
Table and Breakpoints
Algorithm
Data Types
Number of table dimensions:
1
Data specification:
Table and breakpoints
Table data:
[-2 -2 0 0 0 2 2]
Breakpoints specification:
Explicit values
Breakpoints 1:
[-3 -2 -1 0 1 2 3]
Edit table and breakpoints...


Scope
File
Tools
View
Simulation
Help
6
4
2
0
-2
-4
-6
0
1
2
3
4
5
6
7
8
9
10
Ready
Sample based
T=10.000

6. 单滞环继电特性

Lookup Table (n-D)

Perform n-dimensional interpolated table lookup including index searches. The table is a sam
of a function in N variables. Breakpoint sets relate the input values to positions in the ta
dimension corresponds to the top (or left) input port.

Table and Breakpoints | Algorithm | Data Types

Number of table dimensions: 1

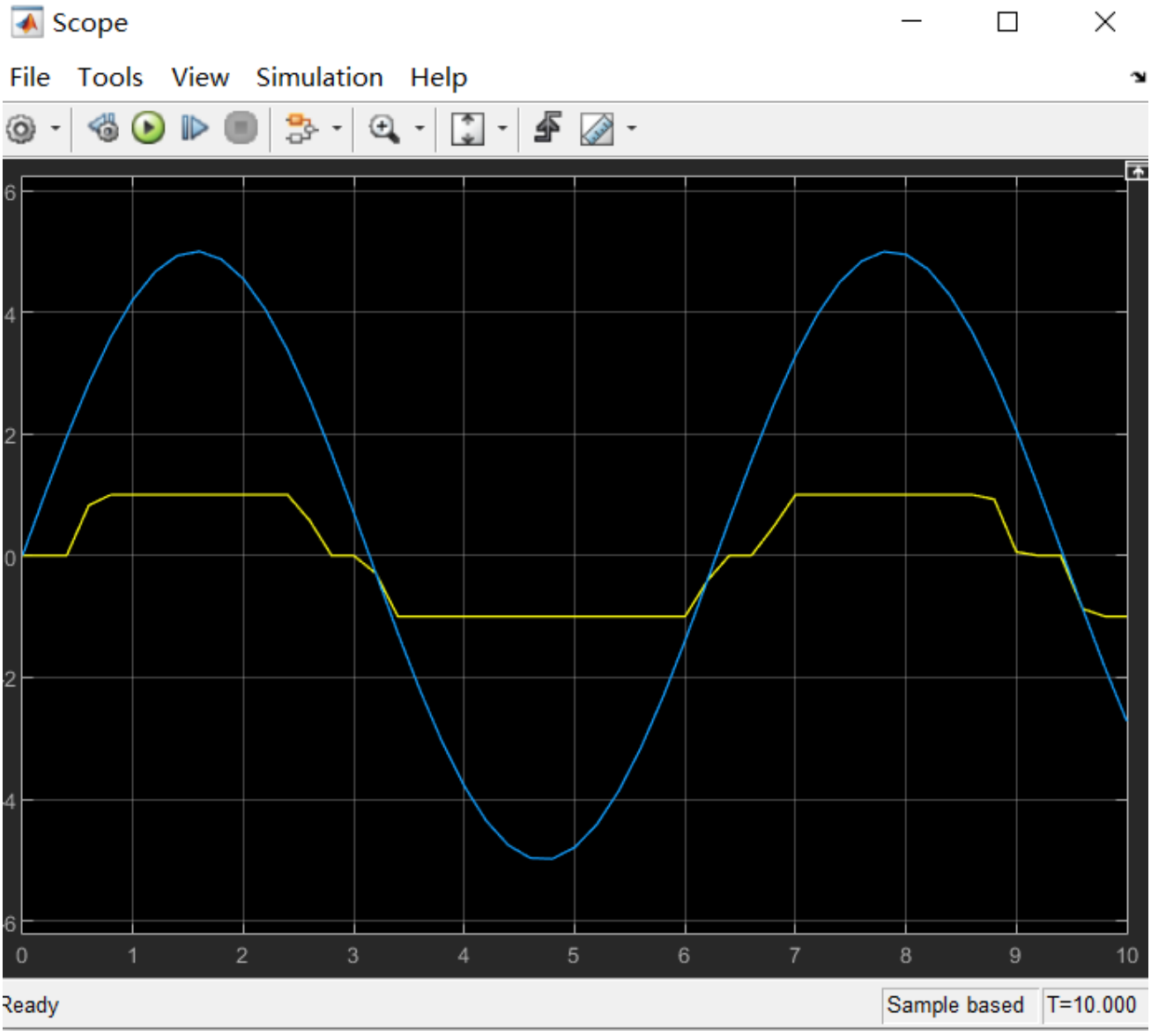
Data specification: Table and breakpoints

Table data: [-1 -1 -1 -1 0 0 0 1 1]

Breakpoints specification: Explicit values

Breakpoints 1: [-4 -3 -2 -1 0 1 2 3 4]

Edit table and breakpoints...



7. 一般继电特性

Lookup Table (n-D)

Perform n-dimensional interpolated table lookup including index searches. The table is a sa
of a function in N variables. Breakpoint sets relate the input values to positions in the t
dimension corresponds to the top (or left) input port.

Table and Breakpoints | Algorithm | Data Types

Number of table dimensions: 1

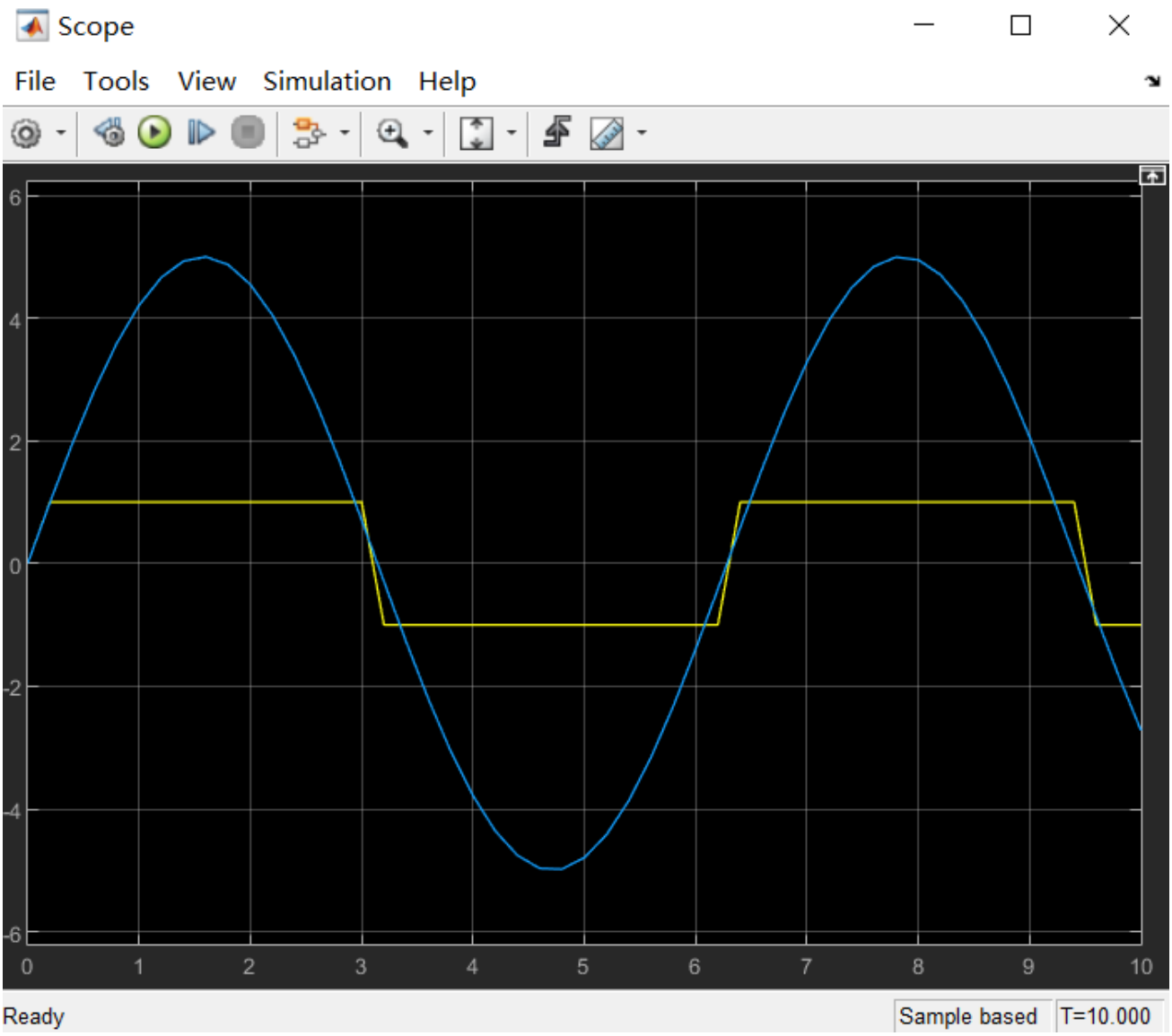
Data specification: Table and breakpoints

Table data: [-1 -1 0 1 1]

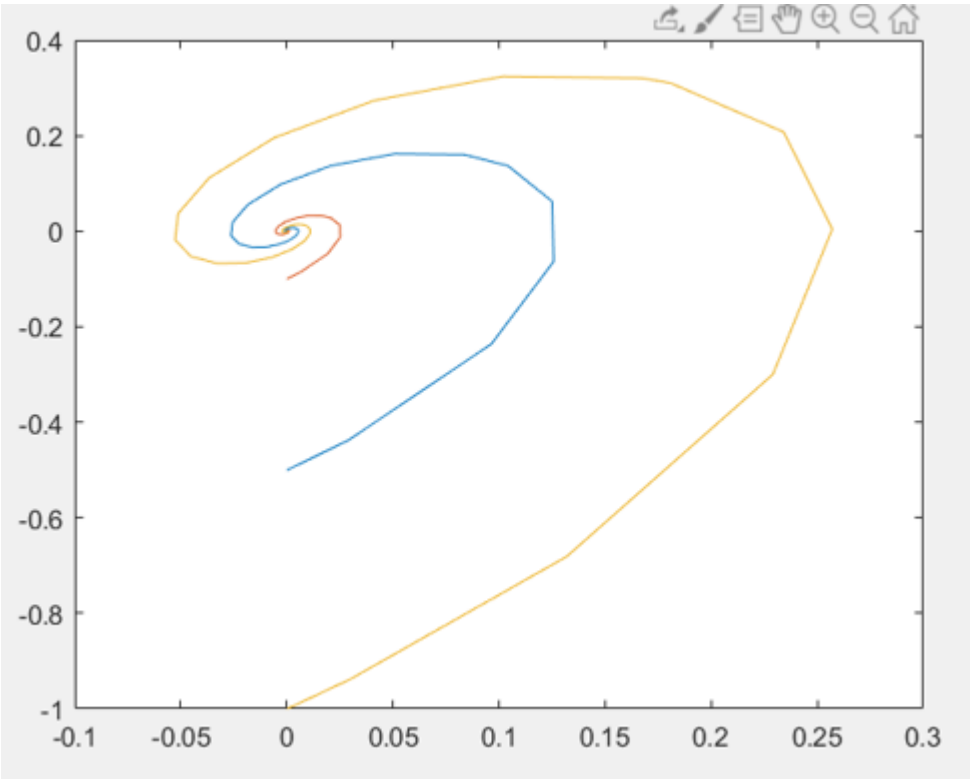
Breakpoints specification: Explicit values

Breakpoints 1: [-2 -0.001 0 0.001 2]

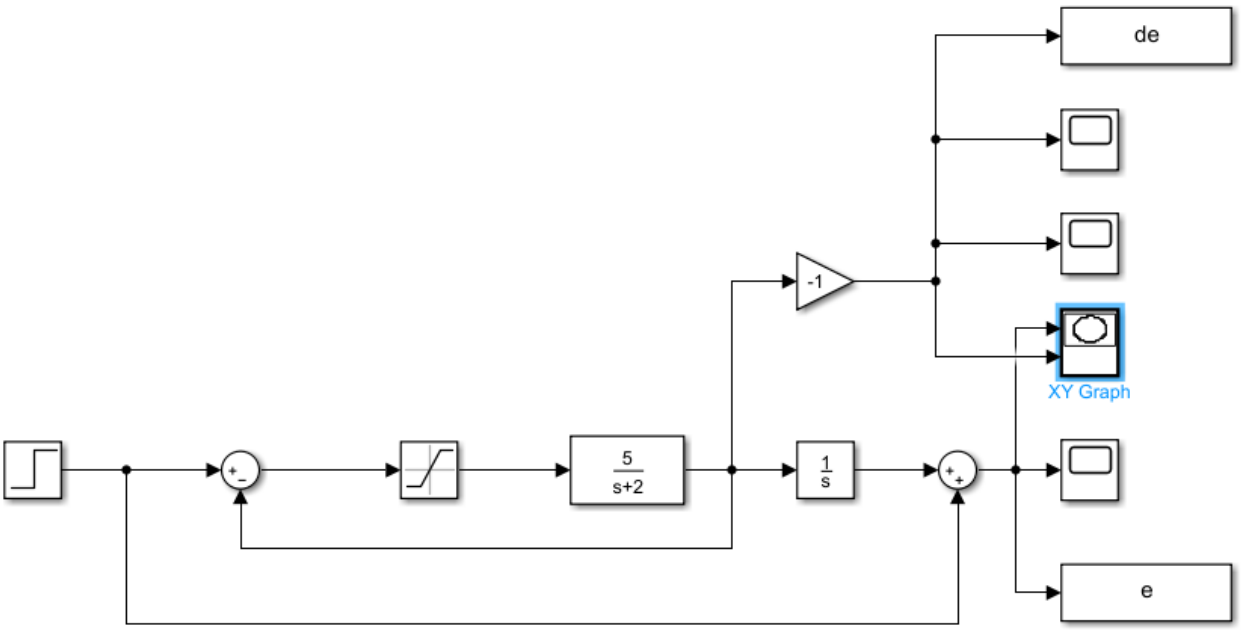
Edit table and breakpoints...

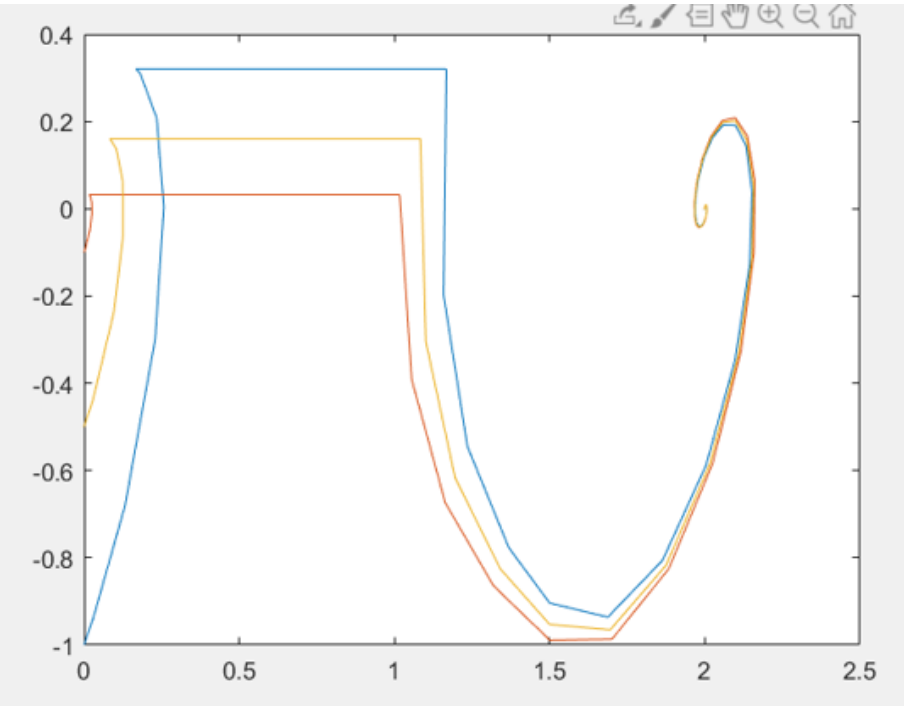


三、 带有饱和特性的系统零输入相平面



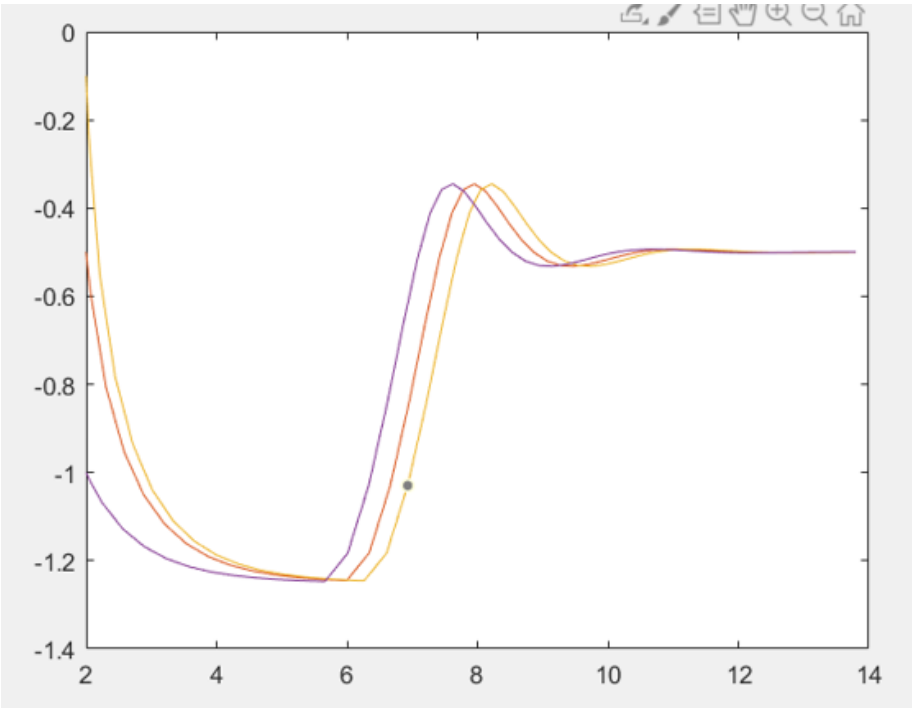
四、 带有饱和特性的单位阶跃输入相平面





五、 带有饱和特性的系统一次函数输入相平面

取输入 R=0.5t+2 为一次函数



六、 含有滞环的继电非线性特性零输入时误差的相轨迹