Quantum Memristor

Circuitos Electricos II

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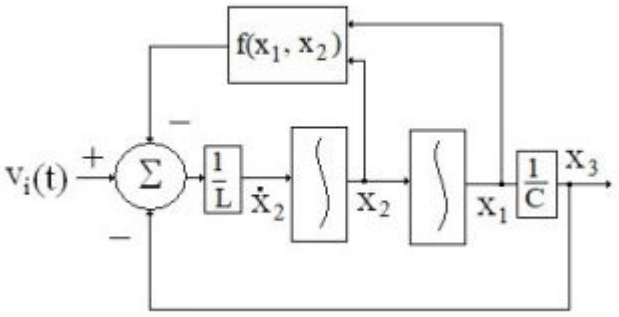
Soluciones propuestas para los ejercicios del taller 11

Sistema



$$\alpha_1(x_1) = \frac{\pi/2}{1+e^{-k_1 x_1}}; \quad \alpha_2(x_2) = \frac{\pi/2}{1+e^{-k_2 x_2}}$$

$$\begin{aligned} f(x_1,x_2) = {} & a_1[\cos\alpha_1(x_1)\cos\alpha_2(x_2)]^2 \\ & +a_2[\cos\alpha_1(x_1)\sin\alpha_2(x_2)]^2 \\ & +a_3[\sin\alpha_1(x_1)\cos\alpha_2(x_2)]^2 \\ & +a_4[\sin\alpha_1(x_1)\sin\alpha_2(x_2)]^2 \end{aligned}$$

Simuilacion con valores iniciales

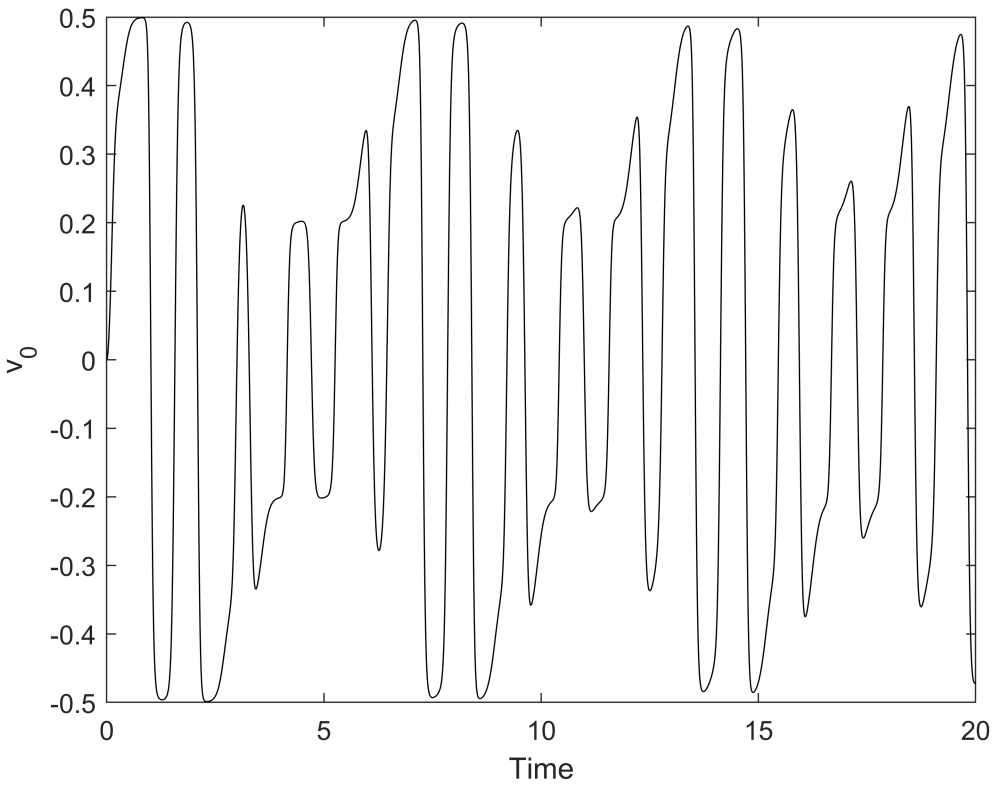
$$\omega = 5.0\ rad/s$$

$$a_1 = -0.2,\quad a_2 = 0.2,\quad a_3 = -0.5,\quad a_4 = 0.5$$

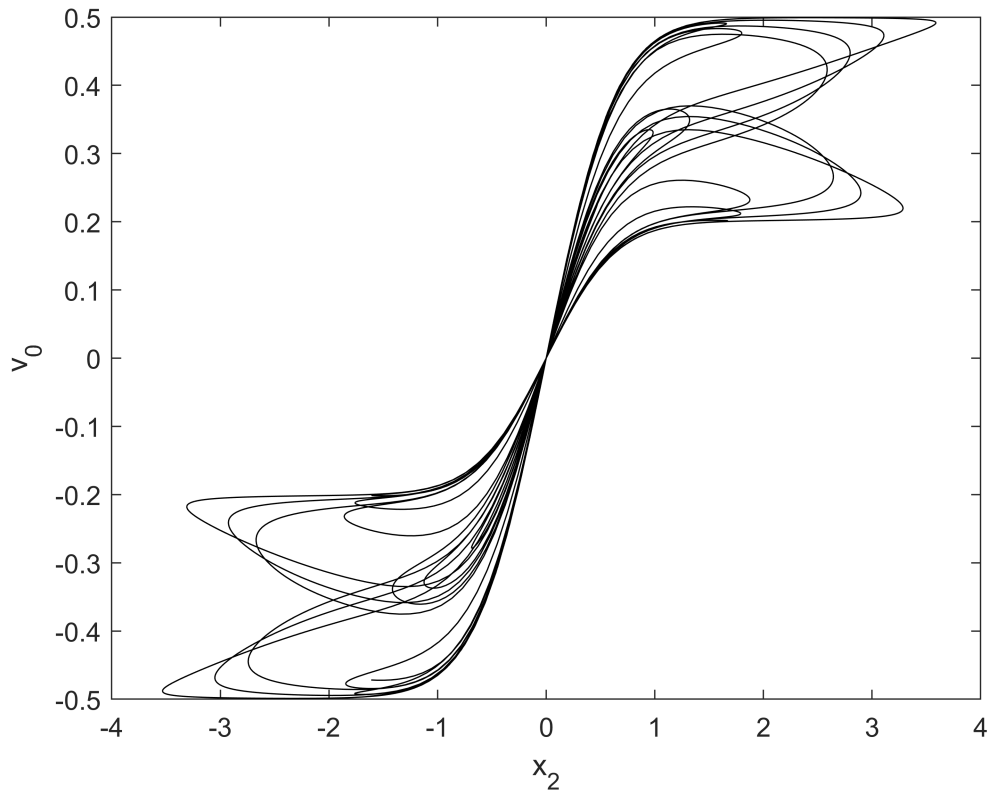
$$k_1 = 2.0,\quad k_2 = 2.0$$

```
w = 5;
A=10;
a1=-0.2;
a2=0.2;
a3=-0.5;
a4=0.5;
k1=2;
k2=2;

L = 1;
C = 1;
```

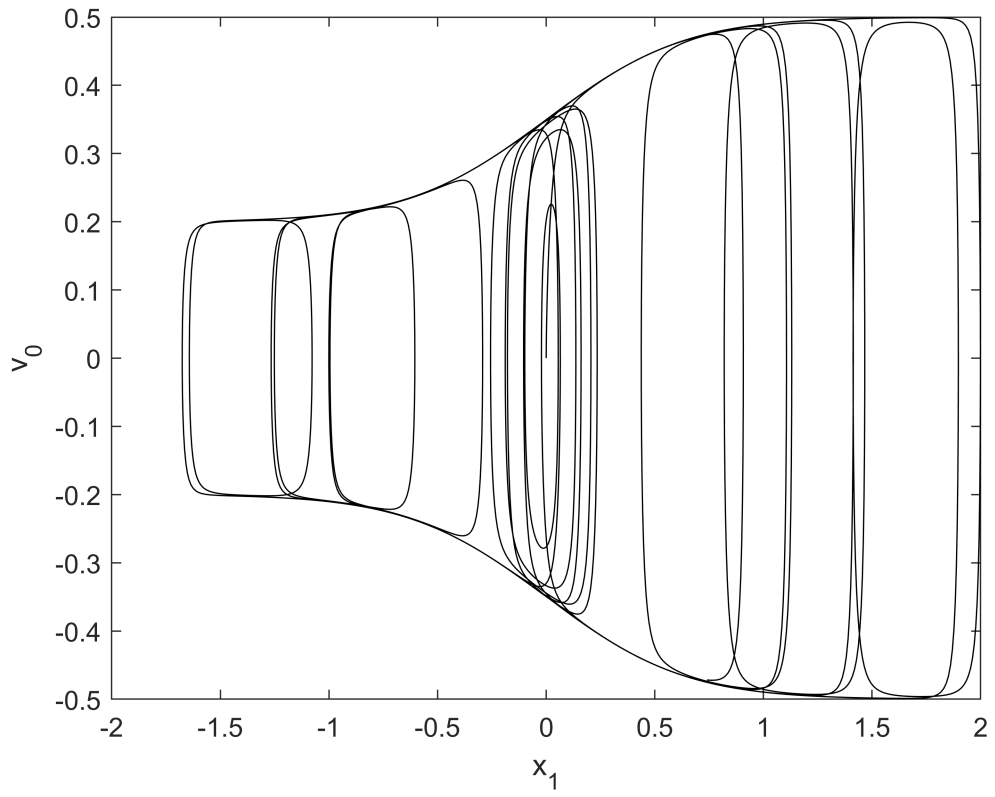
```
xy=out.f_xy.Data;
t=out.f_xy.Time;
x2=out.x2.Data;
x1=out.x1.Data;

figure
plot(t,xy,'k')
xlabel('Time')
ylabel('v_0')
```




```
figure
plot(x2,xy,'k')
xlabel('x_2')
ylabel('v_0')
```




```
figure
plot(x1,xy,'k')
xlabel('x_1')
ylabel('v_0')
```



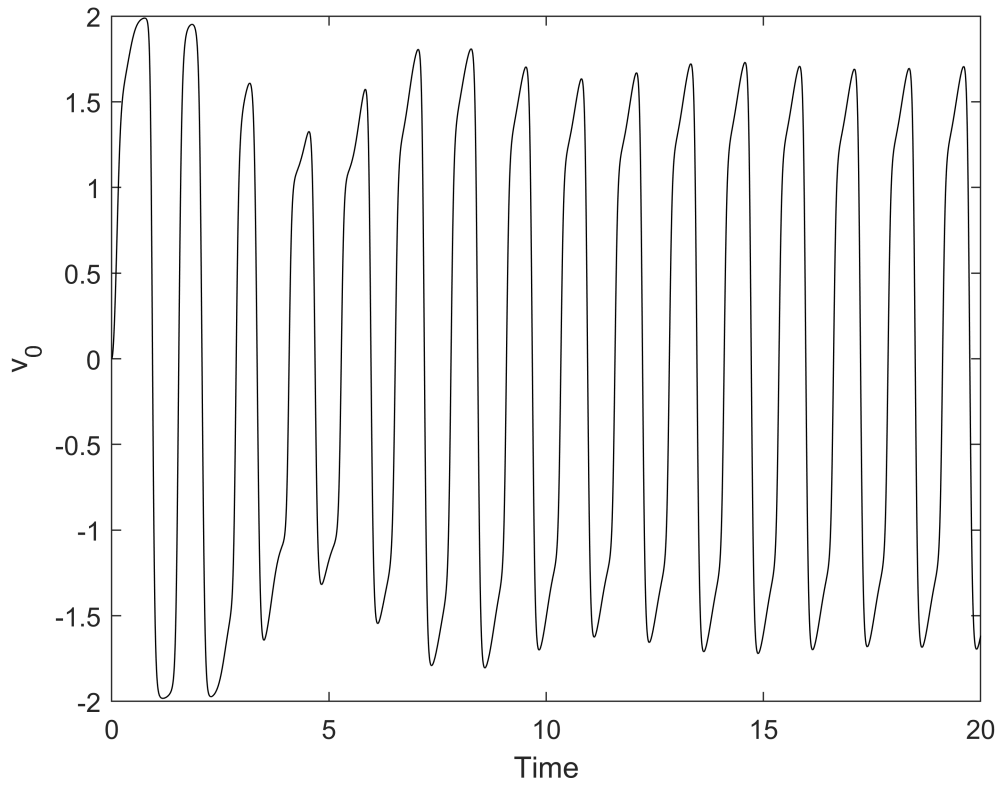
Simuilacion con valores de alfas cambiados

$$\omega = 5.0\ rad/s$$
$$a_1 = -1.0,\ \ a_2 = 1.0,\ \ a_3 = -2.0,\ \ a_4 = 2.0$$
$$k_1 = 2.0,\ \ k_2 = 2.0$$

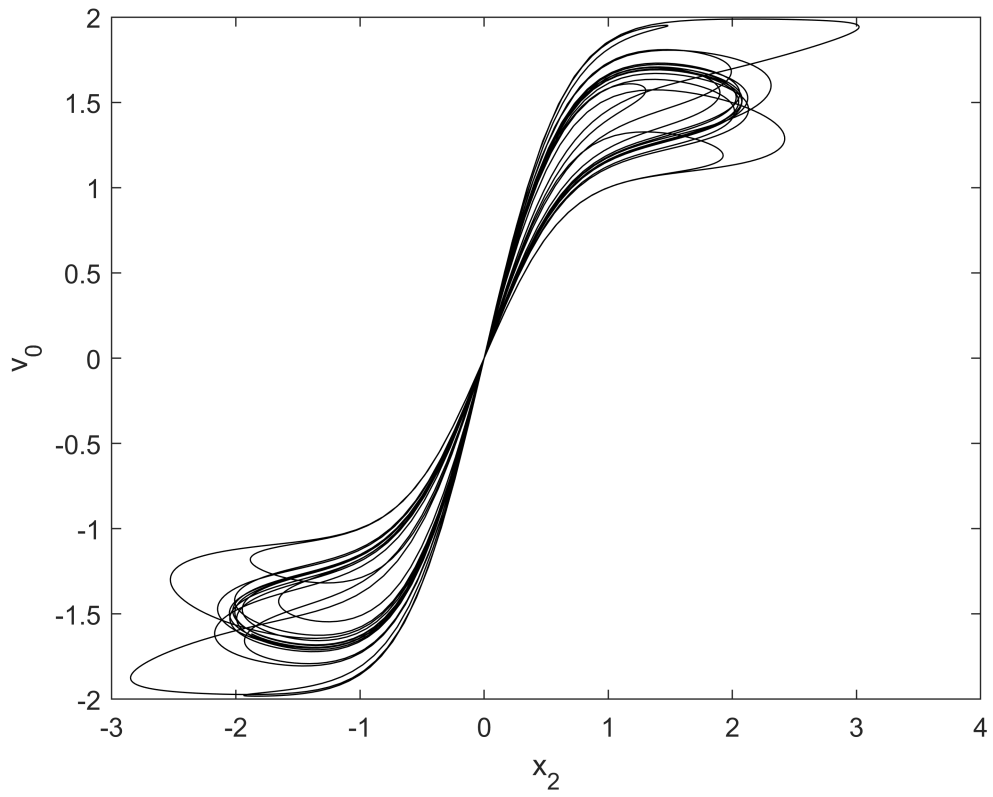
```
w = 5;
A=10;
a1=-1;
a2=1;
a3=-2;
a4=2;
k1=2;
k2=2;
```

```
xy=out.f_xy.Data;
t=out.f_xy.Time;
x2=out.x2.Data;
x1=out.x1.Data;

figure
plot(t,xy,'k')
xlabel('Time')
```

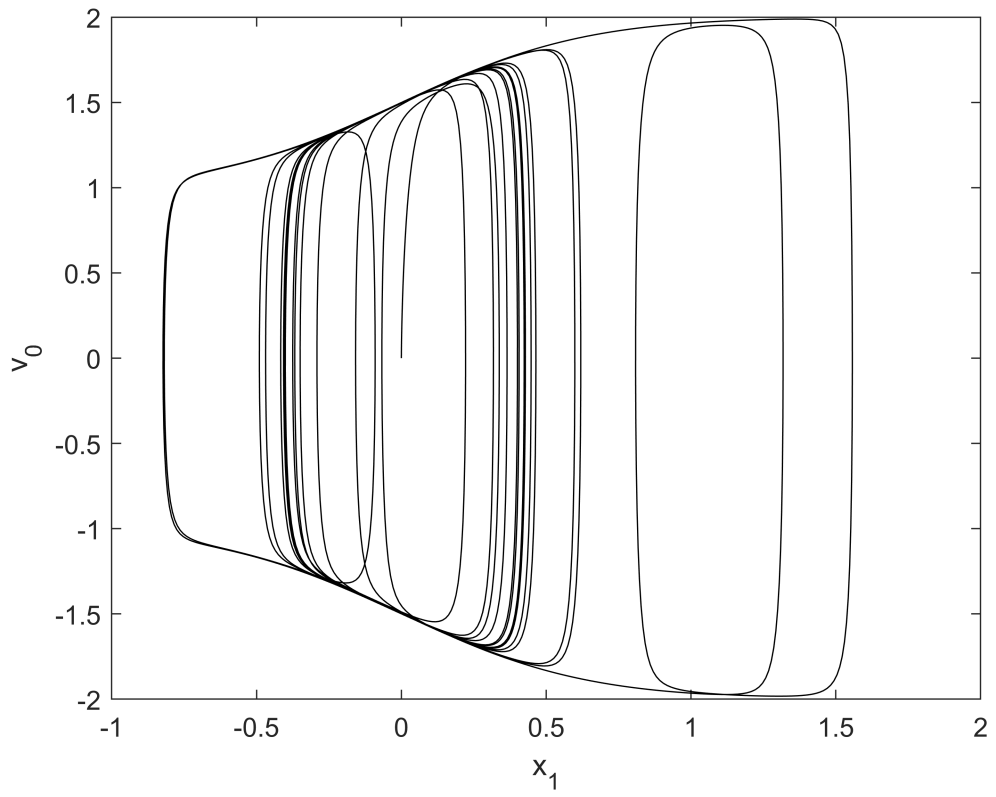
```
ylabel('v_0')
```




```
figure
plot(x2,xy,'k')
xlabel('x_2')
ylabel('v_0')
```




```
figure
plot(x1,xy,'k')
xlabel('x_1')
ylabel('v_0')
```



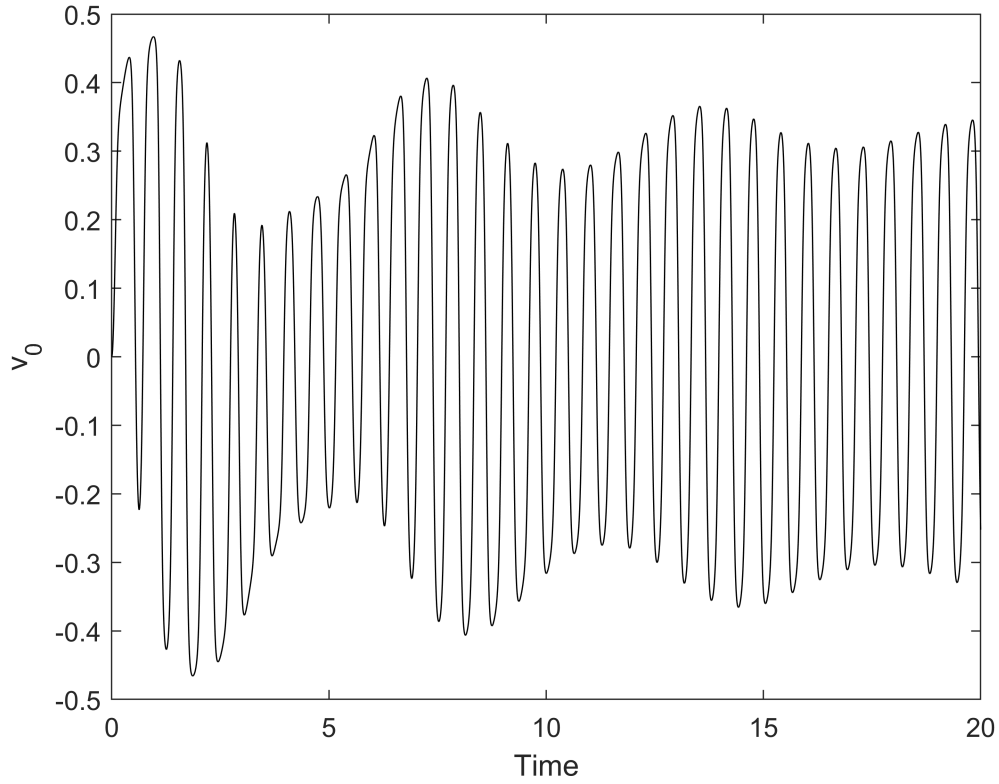
Simuilacion con valor de frecuencia cambiados

$$\omega = 10.0\ rad/s$$
$$a_1 = -0.2,\ \ a_2 = 0.2,\ \ a_3 = -0.5,\ \ a_4 = 0.5$$
$$k_1 = 2.0,\ \ k_2 = 2.0$$

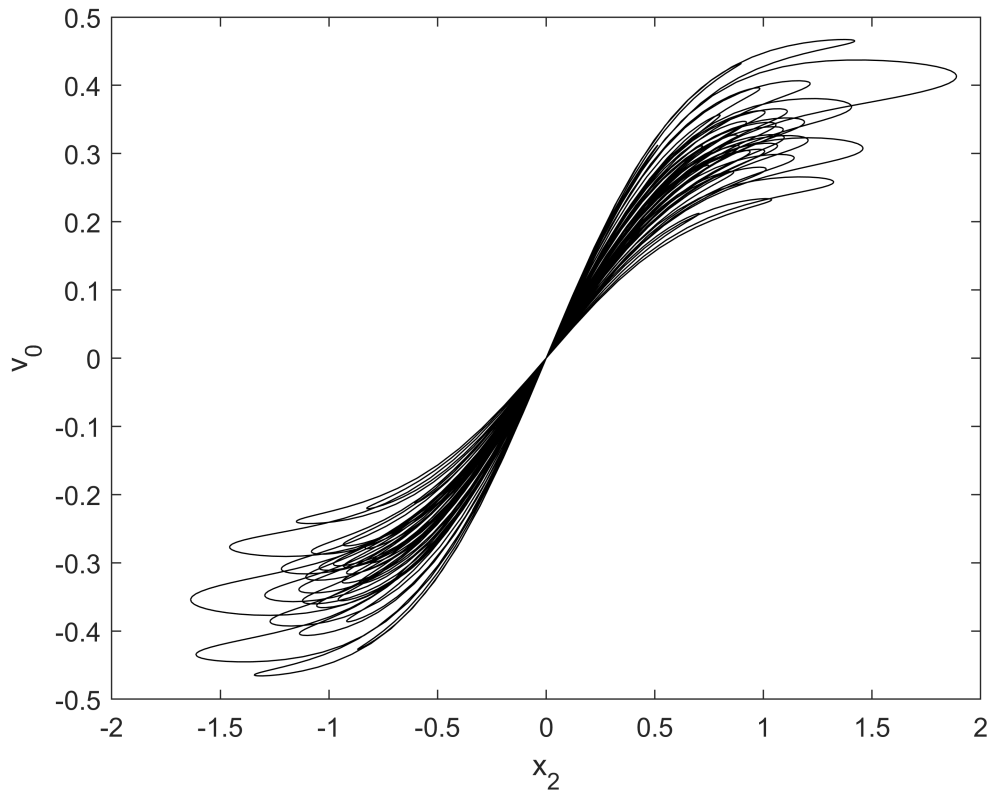
```
w = 10;
A=10;
a1=-0.2;
a2=0.2;
a3=-0.5;
a4=0.5;
k1=2;
k2=2;
```

```
xy=out.f_xy.Data;
t=out.f_xy.Time;
x2=out.x2.Data;
x1=out.x1.Data;

figure
plot(t,xy,'k')
xlabel('Time')
```

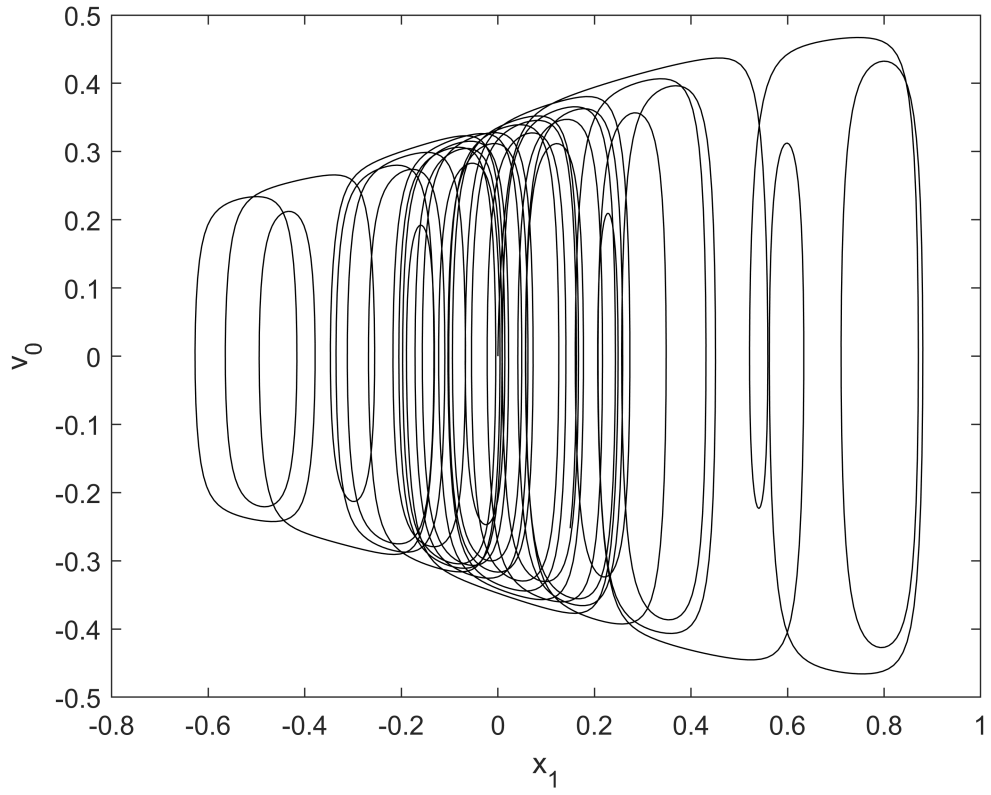
```
ylabel('v_0')
```




```
figure
plot(x2,xy,'k')
xlabel('x_2')
ylabel('v_0')
```




```
figure
plot(x1,xy,'k')
xlabel('x_1')
ylabel('v_0')
```

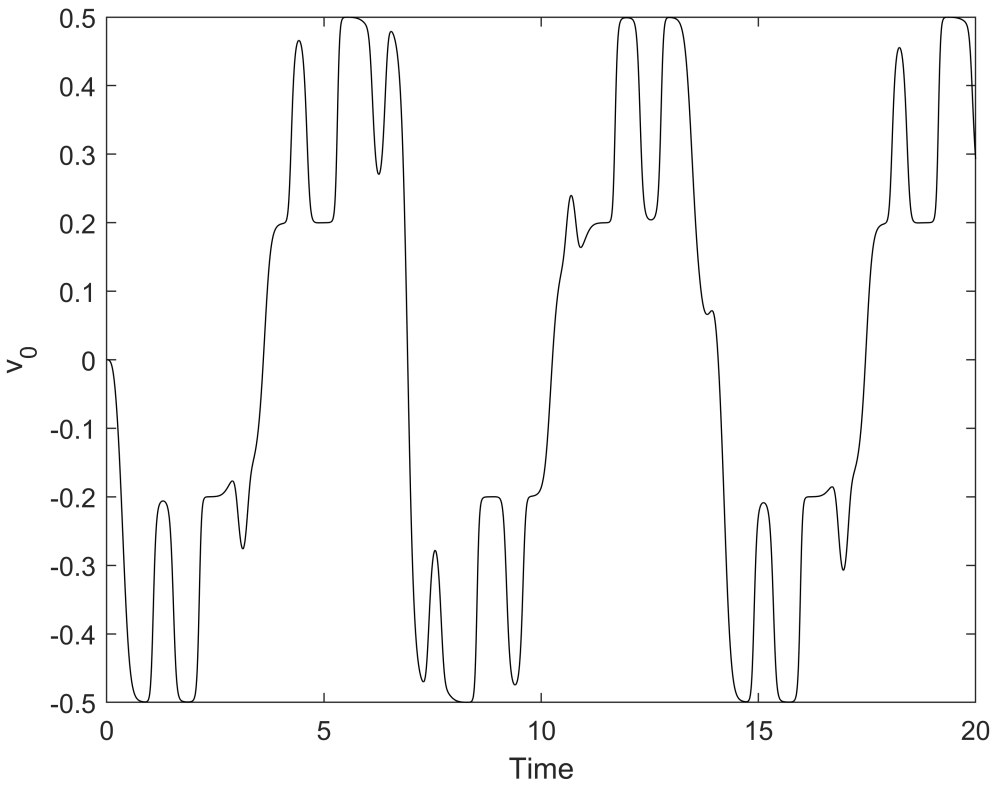


Simuilacion con valores de alfas trucados

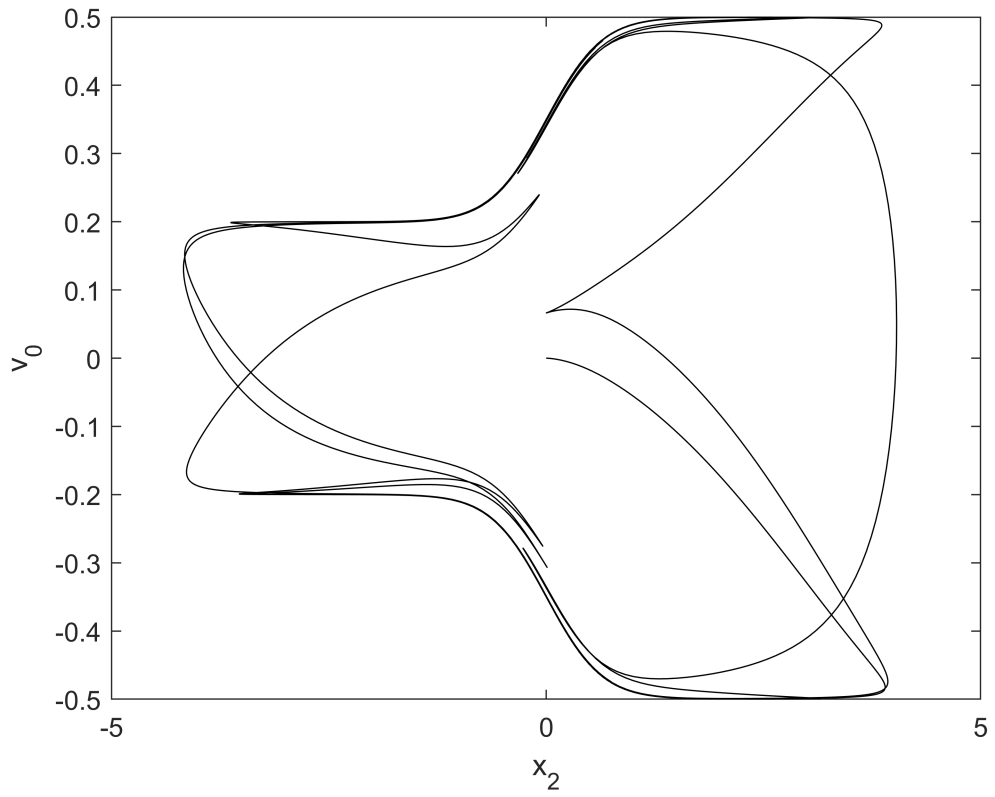
$$\omega = 5.0\ rad/s$$
$$a_1 = 0.2,\ \ a_2 = 0.5,\ \ a_3 = -0.2,\ \ a_4 = -0.5$$
$$k_1 = 2.0,\ \ k_2 = 2.0$$

```
w = 5;
A=10;
a1=0.2;
a2=0.5;
a3=-0.2;
a4=-0.5;
k1=2;
k2=2;
```

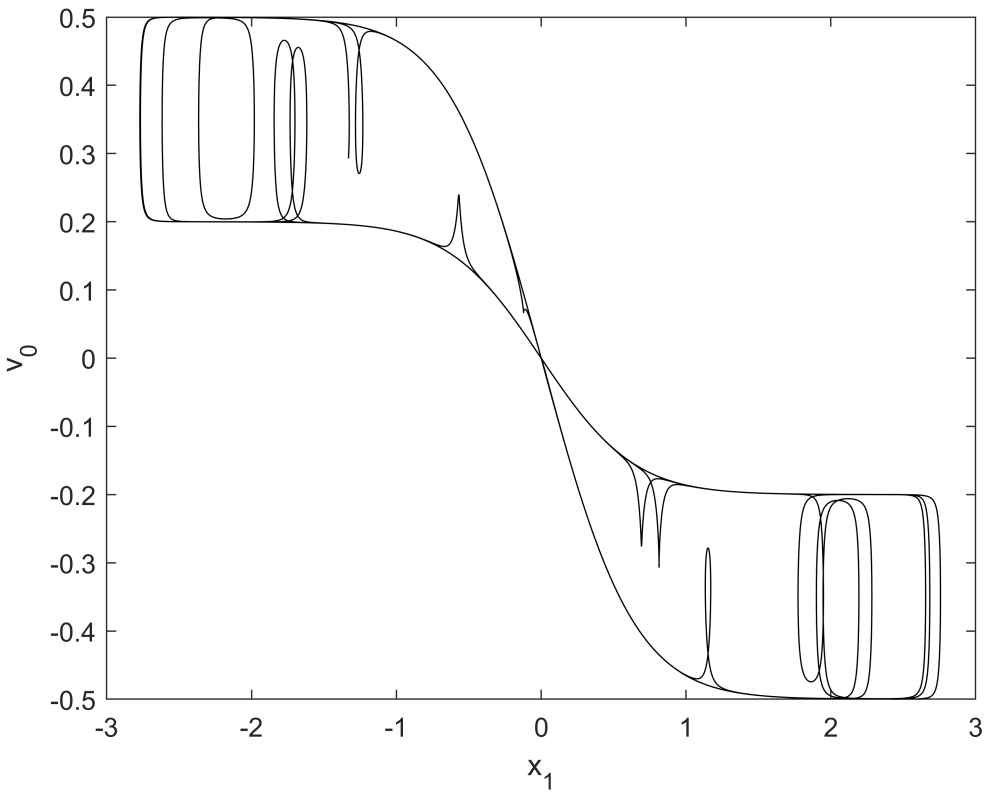
```
xy=out.f_xy.Data;
t=out.f_xy.Time;
x2=out.x2.Data;
x1=out.x1.Data;

figure
plot(t,xy,'k')
xlabel('Time')
ylabel('v_0')
```




```
figure
plot(x2,xy,'k')
xlabel('x_2')
ylabel('v_0')
```




```
figure
plot(x1,xy,'k')
xlabel('x_1')
ylabel('v_0')
```


0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
v0
-3
-2
-1
0
1
2
3
x1