Contents

Initialize

```
clear; clc;
```

Define variables and constants

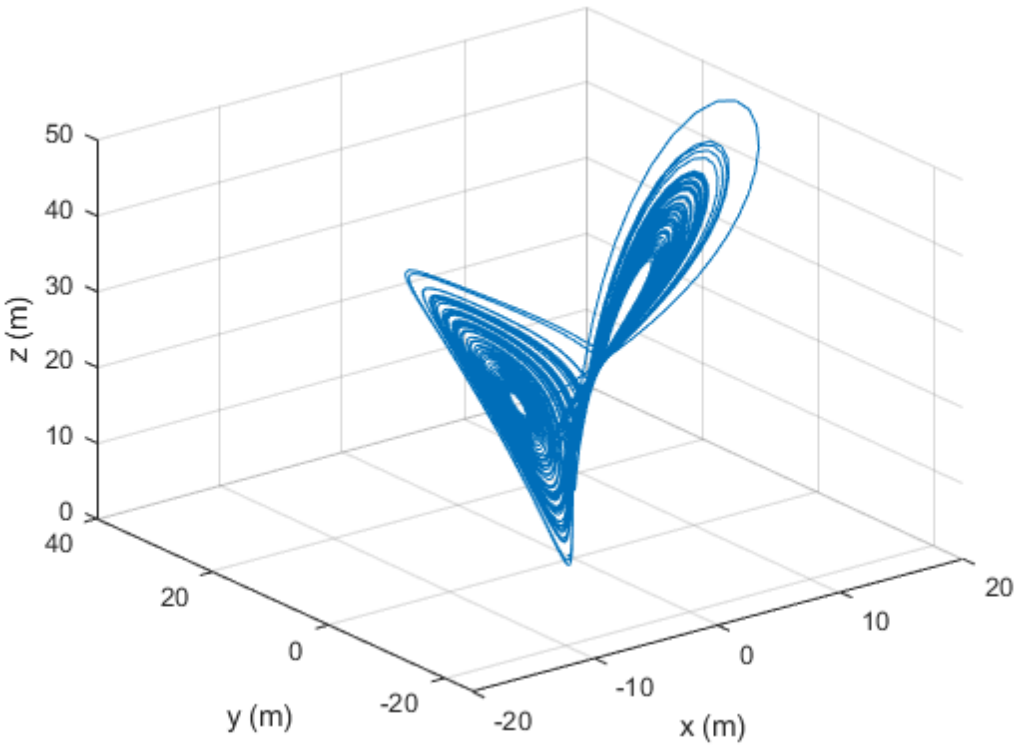
```
tspan = [0,100];
x0 = 0;
y0 = 1;
z0 = 0;
ics = [x0; y0; z0];
```

Solve non-stiff differential equations, medium order method.

```
[t, y] = ode45(@dstate, tspan, ics);
```

Plot results

```
figure;
clf;
plot3(y(:,1), y(:,2), y(:,3));
grid;
xlabel('x (m)');
ylabel('y (m)');
zlabel('z (m)');
```



Define derivative function

```
function ddt = dstate(t, yi)
```

Define constants

```
    sigma = 10;
    beta = 8/3;
    rho = 28;
```

get state from inputs

```
    x = yi(1);
    y = yi(2);
    z = yi(3);
```

Define derivatives

```
    dxdt = sigma*(y - x);
    dydt = x*(rho - z) - y;
    dzdt = x*y - beta*z;
```

create output vector

```
    ddt = [dxdt; dydt; dzdt];
```

```
end
```

Published with MATLAB® R2021a