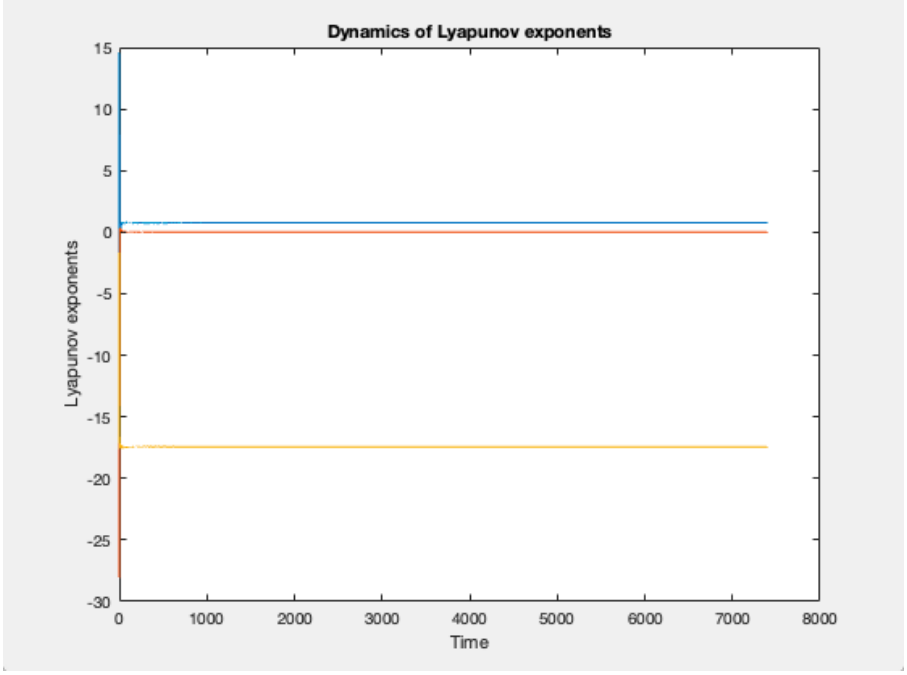
UTFPR - Especialização em Métodos Matemáticos Aplicados
Disciplina: Análise de Sistemas Caóticos
Discente: Cintia Izumi Shinoda

Trabalho 3

Parâmetros:	Expoentes de Lyapunov:
$\sigma = 14;$ $\beta = \frac{5}{3};$ $\rho = 35$	$\lambda_1 = 0.996;$ $\lambda_2 = 0;$ $\lambda_3 = -17.6$

```
[T,Res]=lyapunov_matds(3,@lorenz_ext,@ode45,0,0.01,7400,[0 1 0],10);
plot(T,Res);
title('Dynamics of Lyapunov exponents');
xlabel('Time'); ylabel('Lyapunov exponents');
```

```
t=7399.0000   0.776247   0.000511 -17.443424
t=7399.1000   0.776280   0.000501 -17.443447
t=7399.2000   0.776352   0.000486 -17.443505
t=7399.3000   0.776452   0.000467 -17.443586
t=7399.4000   0.776568   0.000448 -17.443683
t=7399.5000   0.776678   0.000439 -17.443784
t=7399.6000   0.776703   0.000463 -17.443834
t=7399.7000   0.776626   0.000456 -17.443749
t=7399.8000   0.776511   0.000423 -17.443600
t=7399.9000   0.776472   0.000330 -17.443469
t=7400.0000   0.776441   0.000319 -17.443427
```



Parâmetros:	Expoentes de Lyapunov:
$\sigma = 16;$ $\beta = 4$ $\rho = 45$	$\lambda_1 = 1.102;$ $\lambda_2 = 0;$ $\lambda_3 = -20.55$

```
[T,Res]=lyapunov_matds(3,@lorenz_ext,@ode45,0,0.02,35.8,[0 1 0],10);
plot(T,Res);
title('Dynamics of Lyapunov exponents');
xlabel('Time'); ylabel('Lyapunov exponents');
```

```
t=34.0000   1.163532   0.108587 -22.272120
t=34.2000   1.157869   0.104303 -22.262172
t=34.4000   1.150333   0.117249 -22.267582
t=34.6000   1.145295   0.111383 -22.256678
t=34.8000   1.133983   0.129569 -22.263553
t=35.0000   1.131351   0.120712 -22.252064
t=35.2000   1.114261   0.145722 -22.259983
t=35.4000   1.114716   0.134267 -22.248983
t=35.6000   1.117329   0.139267 -22.256596
t=35.8000   1.102413   0.146668 -22.249080
```