

exercicios_1

April 29, 2022

```
[1]: import numpy as np
import matplotlib.pyplot as plt
```

```
[2]: def C_converge(C_t,d):
    while True:

        Ks = 1+0.5/C_t

        C_p = tau_ss*np.pi*d**2/(8*Fs*Ks)

        error = ((C_p-C_t)**2)**0.5

        C_t = (C_p+C_t)/2

        if error <= C_t*0.01:
            return C_t
```

```
[3]: G = 11.5e6
d_list = np.linspace(0.01,0.1875,num=500)
tau_ss = 81e3
Fs = 115.5
Ks = 1.0625

C_list = []

for d in d_list:
    C_list.append(C_converge(8,d))
```

```
[4]: fig = plt.figure(figsize=[16, 9])
fig.suptitle('Indice da mola em função do diâmetro do fio.', fontsize=16)

# Plotando 2D

ax = fig.add_subplot(1, 1, 1)

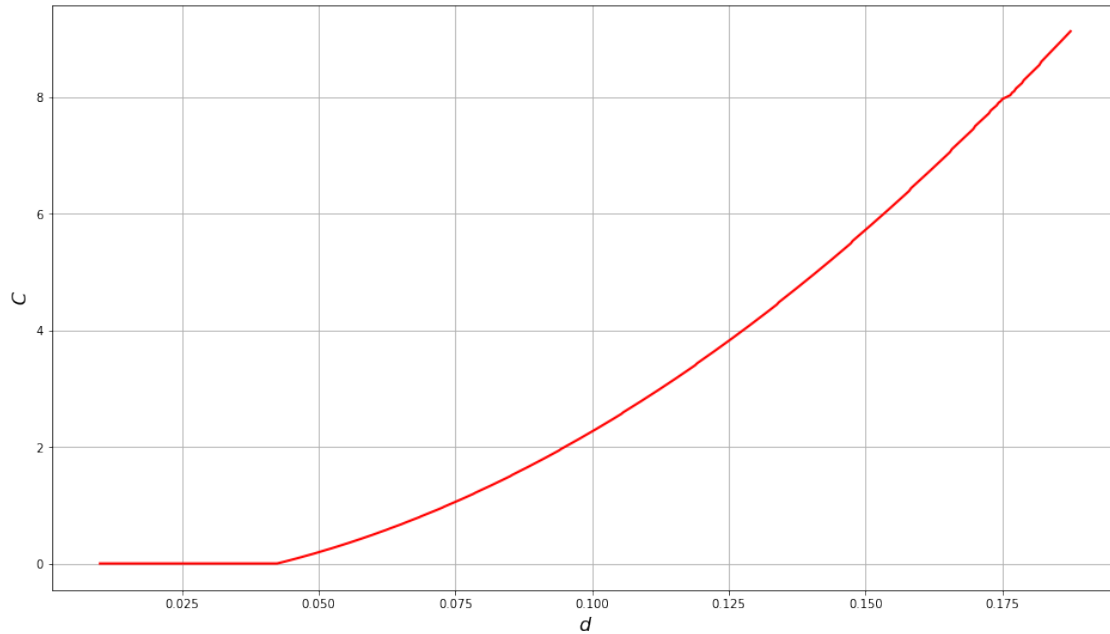
ax.set_ylabel('$C$', fontsize=16)
ax.set_xlabel('$d$', fontsize=16)
```

```
ax.plot(d_list, C_list, 'r', linewidth=2)

ax.grid()

plt.show()
```

Índice da mola em função do diâmetro do fio.



```
[5]: d = 0.17
      C = tau_ss*np.pi*d**2/(8*Fs*Ks)
      C
```

```
[5]: 7.490862483105015
```

```
[6]: D = C*d
      D
```

```
[6]: 1.2734466221278526
```

```
[7]: k = (105-60)/0.5
      k
```

```
[7]: 90.0
```

[8]: $N = G * d^{**4} / (8 * D * k)$
N

[8]: 10.475633207092436

[9]: $N_t = N + 2$
Nt

[9]: 12.475633207092436

[10]: $L_s = d * N_t$
Ls

[10]: 2.120857645205714

[11]: $L_f = F_s / k + L_s$
Lf

[11]: 3.404190978539048

[12]: $F_s / k / L_f$

[12]: 0.3769862917279959

[13]: L_f / D

[13]: 2.6732105762319662

[]: