TP 17 : Indice de réfraction d'un prisme

Code Capytale : 532c-10492853

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

Incertitudes de A et Dm : mise en commun des résultats des différents groupes

Entrée[2]:
```
liste_A=[60.025,60.13,60,60.017,60.017,59.98,60.11,59.9,60,60.02,60.12,60.05,59,59.91,60.18,59.98]
```

Entrée[3]:
```
liste_Dm=[63.62,63.5,58.95,63.92,64.23,59.03,63.46,63.6,63.11,64.01,63.5,63.08,63.58,62.71,63.92]
```

Entrée[4]:
```
u_A=np.std(liste_A,ddof=1)/np.sqrt(len(liste_A))
```

Entrée[5]:
```
u_Dm=np.std(liste_Dm,ddof=1)/np.sqrt(len(liste_Dm))
```

Entrée[6]:
```
print(u_A,u_Dm)
```

```
0.067055105991888 0.4267464955082483
```

Lampe à vapeur de mercure

Entrée[25]:
```
A=1.05 # ma valeur en radians
l=np.array([578,546.1,491.6,435.3,404.6])
Dm=[63.03,63.63,64.95,67.24,68.95]
Dmrad=np.array([d*np.pi/180 for d in Dm])
n=np.sin((A+Dmrad)/2)/np.sin(A/2)
x=1/(l**2)
plt.plot(x,n,'o')
[a,b]=np.polyfit(x,n,1)
print(a,b)
plt.plot(x,a*x+b)
plt.show()
```

```
15026.623696008452 1.7094227051839668
```

Incertitudes sur a et b

Entrée[27]:
```
N = 10000
liste_a=[]
liste_b=[]
for k in range (N):
    Dm_sim=Dmrad+np.sqrt(3)*np.pi/180*np.random.uniform(-u_Dm,u_Dm,len(Dmrad))
    A_sim=A+np.sqrt(3)**np.pi/180*np.random.uniform(-u_A,u_A)
    n_sim=np.sin((A_sim+Dm_sim)/2)/np.sin(A_sim/2)
    a,b=np.polyfit(x,n_sim,1)
    liste_a.append(a)
    liste_b.append(b)
u_a=np.std(liste_a,ddof=1)
u_b=np.std(liste_b,ddof=1)
print(u_a)
print(u_b)
```

```
1274.380487045614
0.00600532866687512
```

Figure 1