

Regresión lineal:

```
2 import numpy as np
3 import matplotlib.pyplot as plt
4
5 I=[-3.15,-2.65,-2.15,-1.65,-1.15,-0.65,-0.15,0.15,0.65,1.15,1.65,2.15,2.65,3.15]
6 B=[-31.8,-24.6,-16.5,-11.6,-6.6,-4.7,-1.2,1,3.4,8.1,13.4,17.8,18.7,24.2]
7
8 I = np.array(I)
9 B = np.array(B)
10
11
12 coef = np.polyfit(I, B, 1)
13 poly = np.poly1d(coef)
14
15
16 B_ajustada = poly(I)
17
18
19 plt.figure(figsize=(8, 6))
20
21 plt.plot(I, B, '-o', label='Datos originales', color='blue')
22
23
24 plt.plot(I, B_ajustada, '-', label=f'Regresión lineal\mathbf{{coef[0]:.2f}}x + \mathbf{{coef[1]:.2f}}', color='red')
25
26
27
28 plt.xlabel('Corriente (A)')
29 plt.ylabel('Campo magnético (mT)')
30 plt.title('Campo magnético vs Corriente')
31 plt.legend()
32 plt.grid(True)
33
34
35 plt.show()
```

Residuales:

```
1 import matplotlib.pyplot as plt
2
3
4 corriente = [-3.15, -2.65, -2.15, -1.65, -1.15, -0.65, -0.15, 0.15, 0.65, 1.15, 1.65, 2.15, 2.65, 3.15]
5 residuales = [5.167, 2.077, -1.913, -2.703, -3.593, -1.383, -0.773, -0.507, 1.203, 0.613, -0.577, -0.867, 2.343, 0.953]
6
7
8 plt.figure(figsize=(8, 6))
9 plt.plot(corriente, residuales, '-o', label='Residuales')
10 plt.axhline(0, color='gray', linestyle='--', linewidth=0.8)
11
12
13 plt.xlabel('Corriente (A)')
14 plt.ylabel('Residuales (mT)')
15 plt.title('Gráfica de Residuales')
16 plt.legend()
17 plt.grid(True)
18
19
20 plt.show()
21
```

Curva hierro:

```
1 import matplotlib.pyplot as plt
2
3
4 deformacion_elastica = [4.63, 17.914, 27.508]
5 B = [0, 2.22041e-6, 0]
6
7
8 plt.figure(figsize=(8, 6))
9 plt.plot(deformacion_elastica, B, 'o', label='Curva de hierro', color='blue')
10
11
12 plt.xlabel('Deformación elástica')
13 plt.ylabel('Campo magnético B (mT)')
14 plt.title('Curva de hierro')
15 plt.grid(True)
16 plt.legend()
17
18
19 plt.show()
20
```