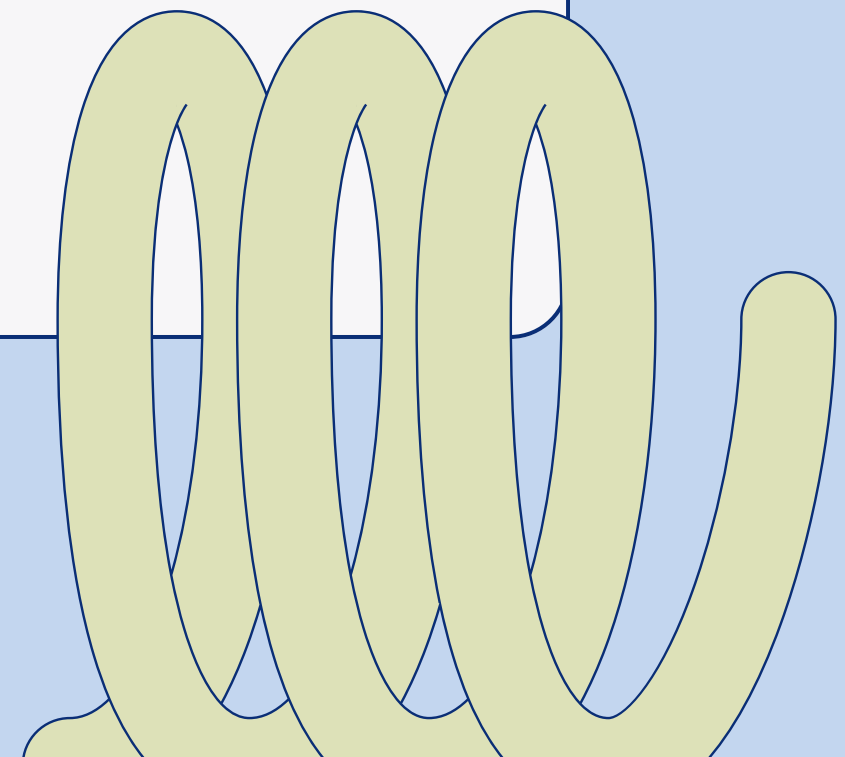
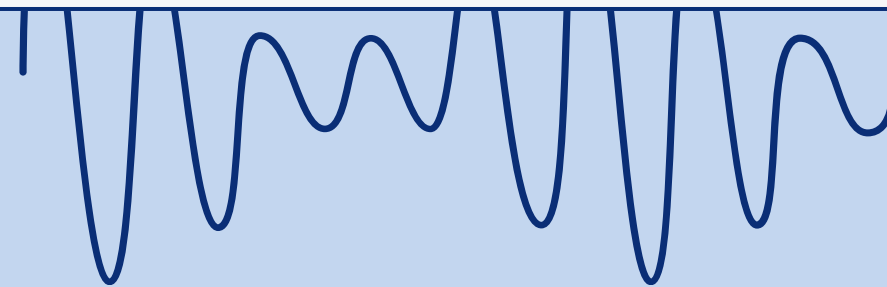
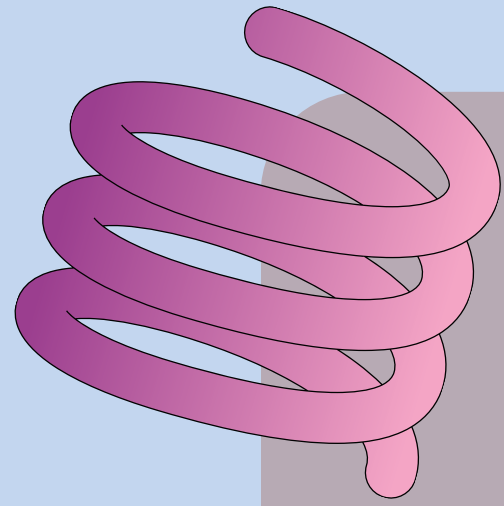


BOBINES DE

Helmholtz

ANA SANTOS, JOANA SANTIAGO, MAFALDA FRANÇA

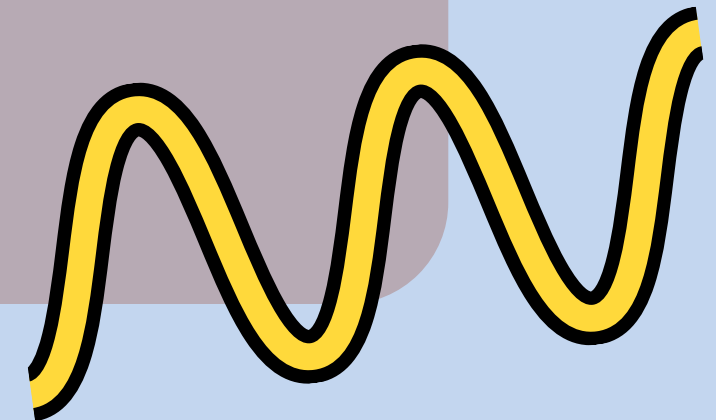
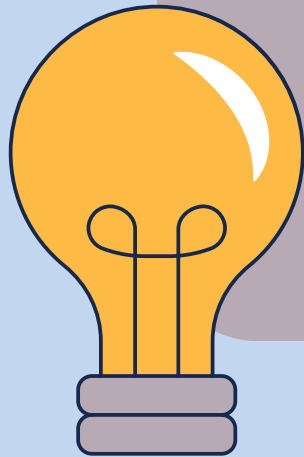




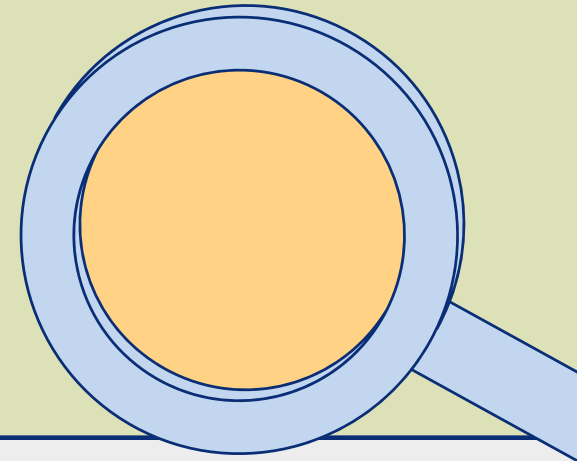
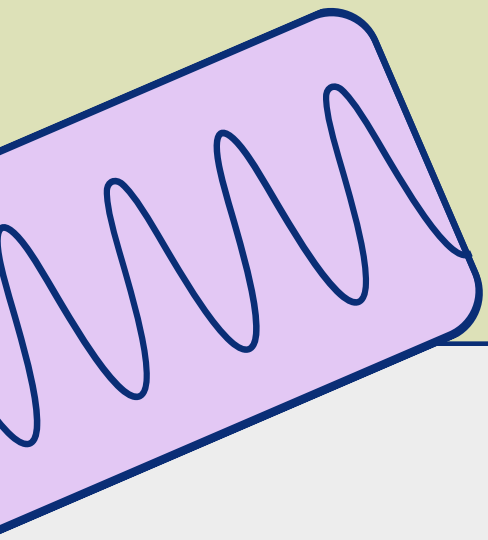
CONTEÚDO:



- 1. OBJETIVOS**
- 2. INTRODUÇÃO**
- 3. PROCEDIMENTO EXPERIMENTAL**
- 4. CONCLUSÃO**



Objetivos



Calibrar Sonda de Efeito de Hall

por meio de um solenoide padrão.

Estabelecer a configuração de Helmholtz

e medir o campo magnético ao longo do eixo das respectivas bobinas.

Verificar o Princípio da sobreposição

a soma do valor dos campos = ao valor medido com as duas bobines ativas.

Introdução:



Conhecimentos:

- Campo Magnético
- Lei de Ampère
- Fluxo do Campo Magnético
- Equações de Faraday

Fórmulas usadas:

$$B_{\text{sol}} = \mu_0 (N/l) I_s$$

(componente longitudinal)

$$B(x) = (\mu_0/2) / (R^2 + x^2)^{3/2}$$

(campo magnético criado pelas bobinas num ponto x genérico)

$$\Delta C/C = \Delta N/N + \Delta l/l + \Delta m/m$$

(cálculo da incerteza)

$$B = C_c V_H$$

(relação entre o campo magnético e a constante de calibração)

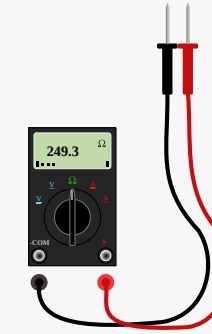
$$B(x) = \mu_0 I R^2 / 2(R^2 + (x-x_0)^2)^{3/2}$$

(campo magnético ao longo de x devido ao solenoide)

Material:



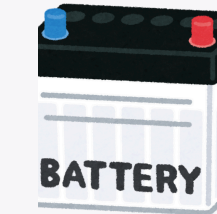
- Voltímetro



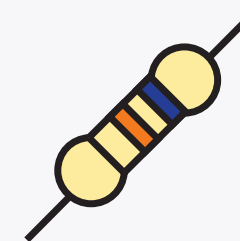
- Amperímetro



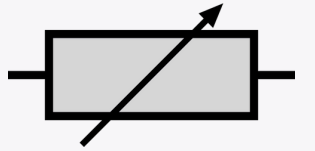
- Fonte de Tensão de 15 V



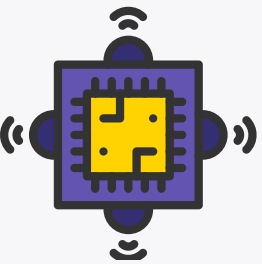
- Resistência de 10 Ω



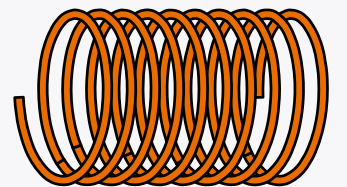
- Reóstato de 330 Ω



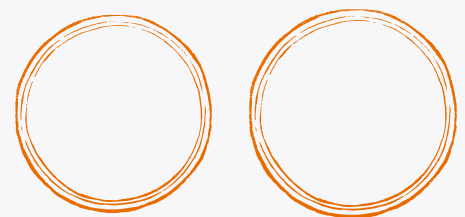
- Sonda de Efeito de Hall



- Solenoide

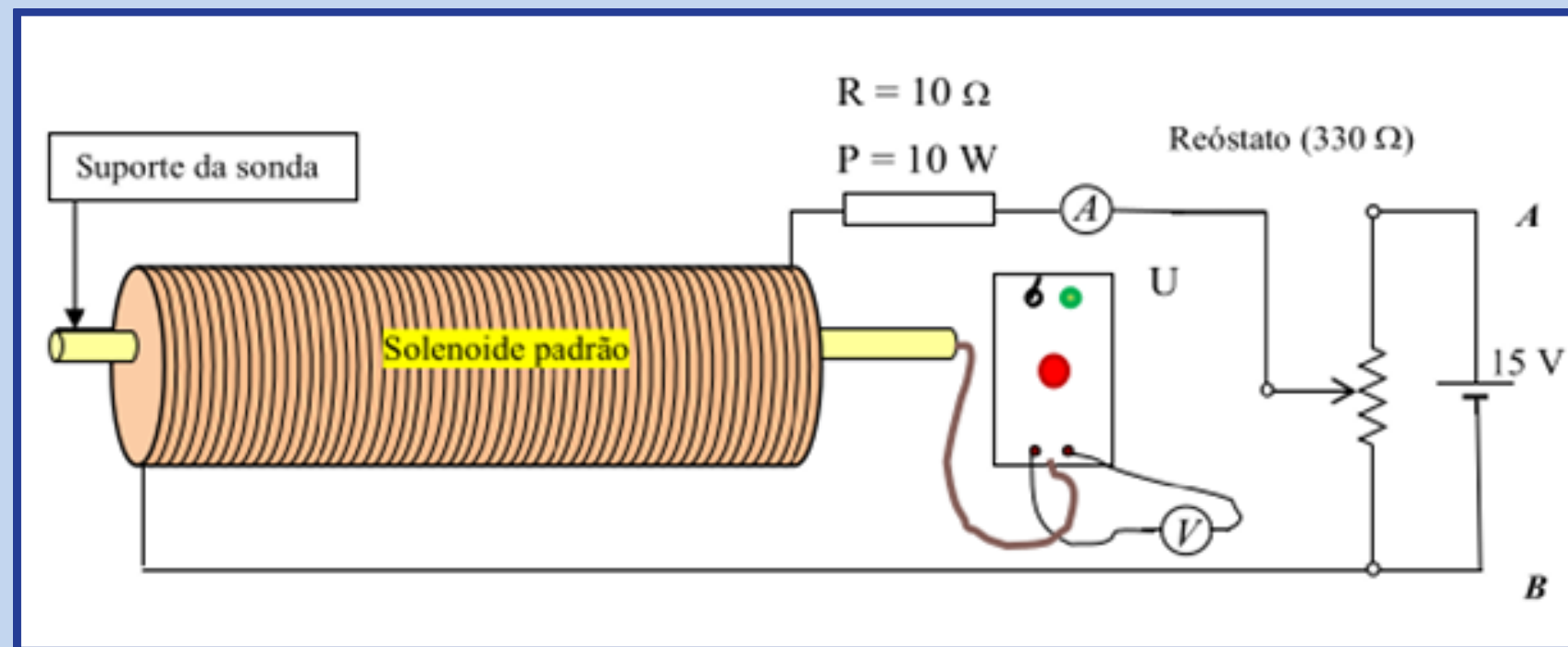


- Bobinas de Helmholtz

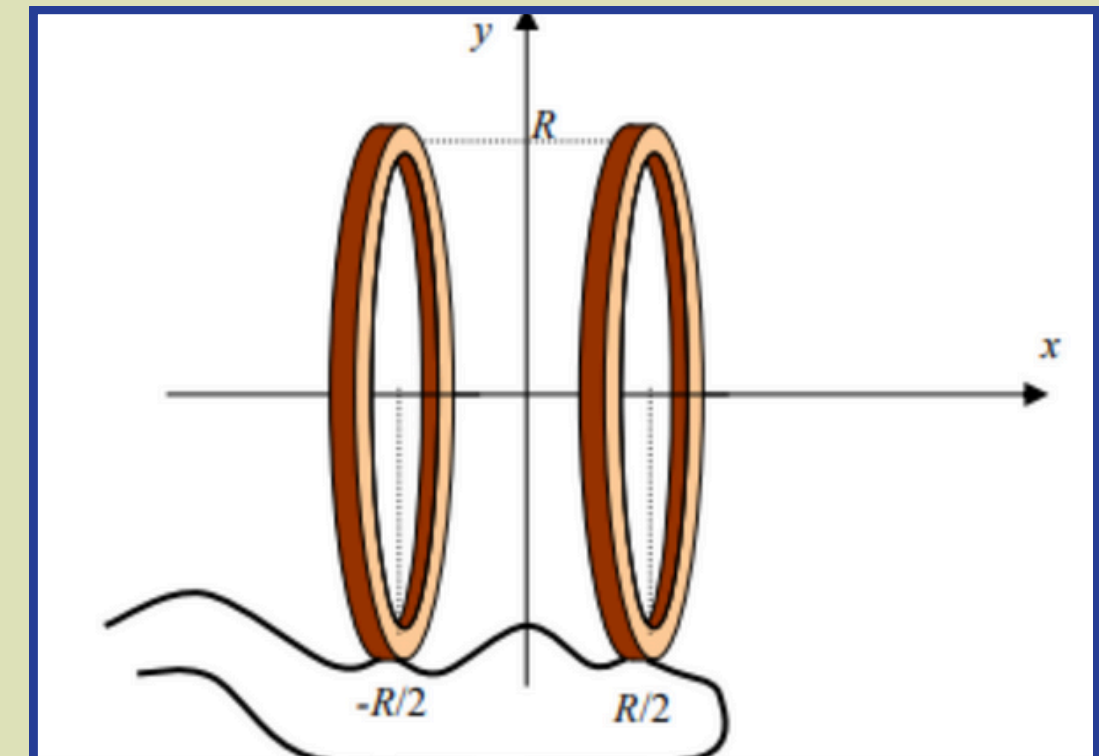


Procedimentos Experimentais:

Solenóide



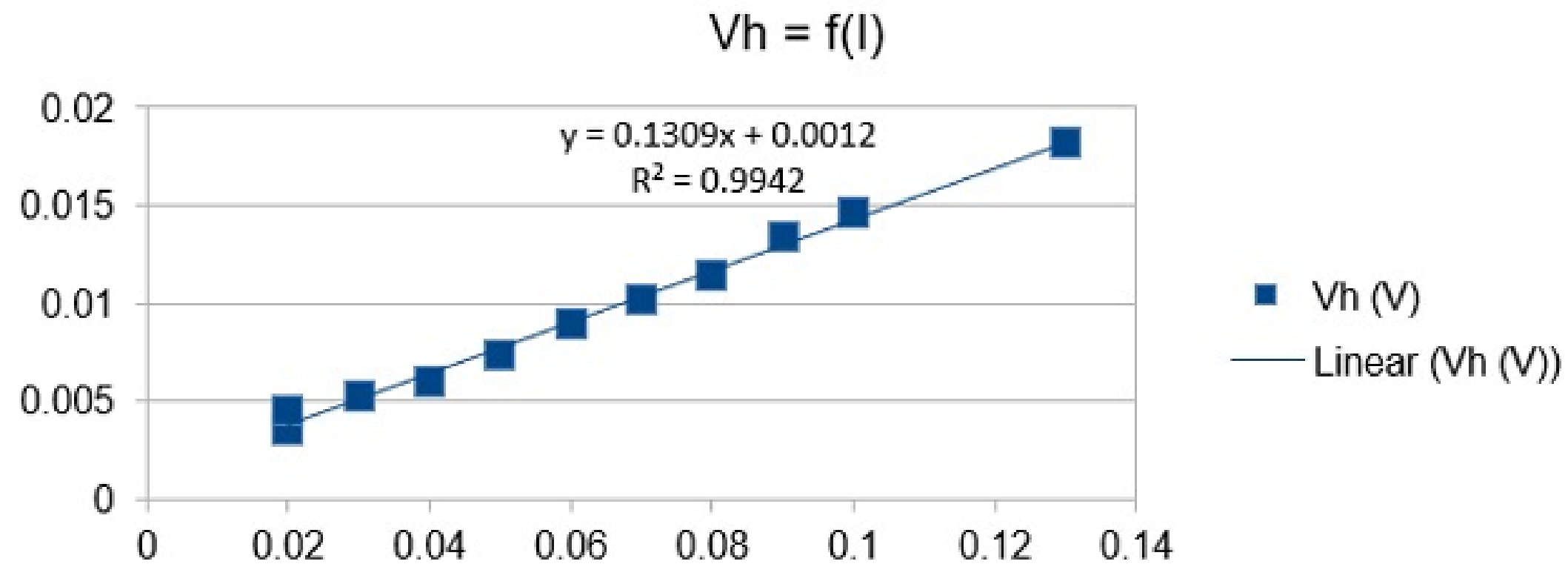
Bobinas de Helmholtz



Resultados

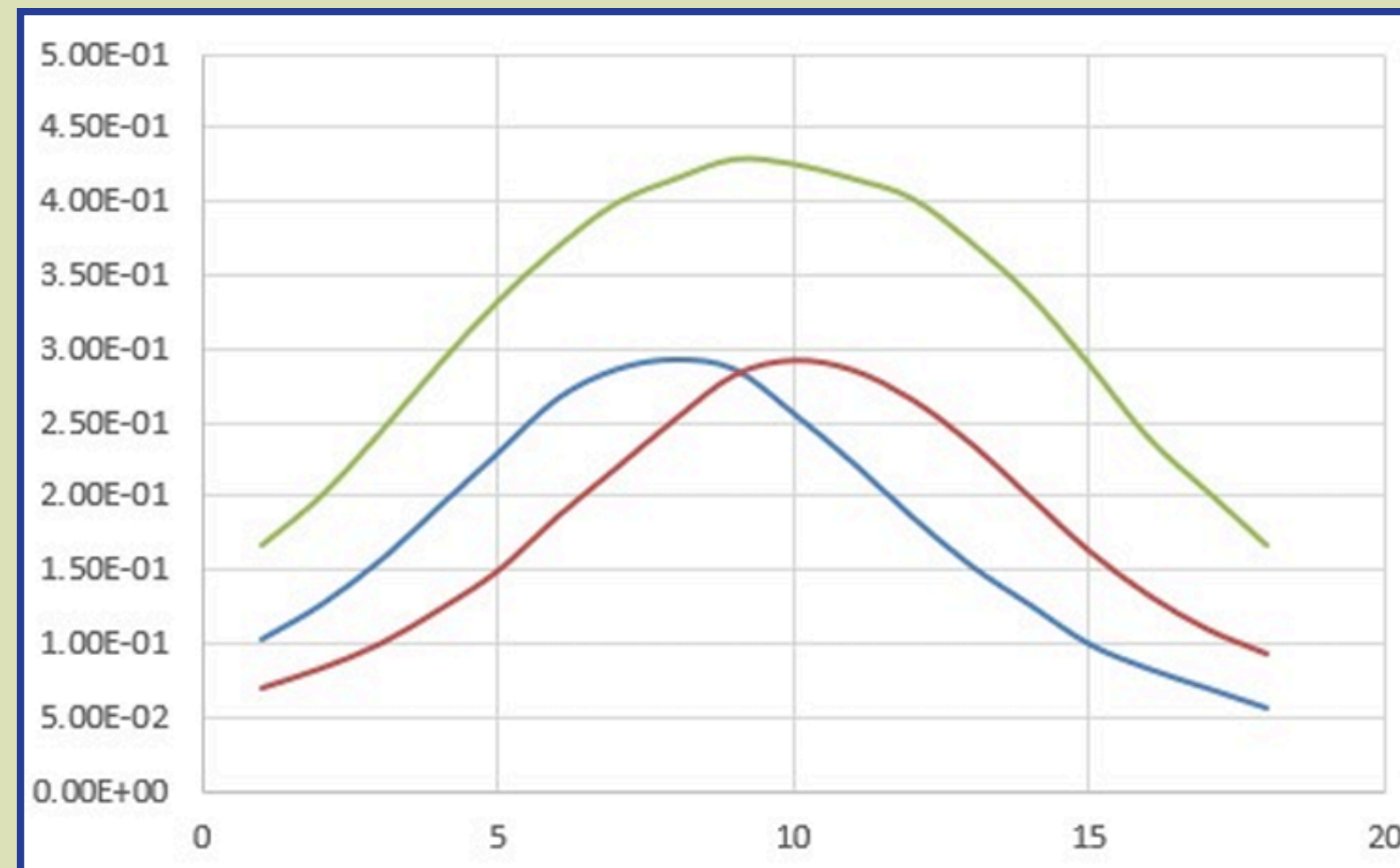
Parte A:

I (A)	Vh (V)	Declive
0.02	0.0036	0.1309
0.02	0.0046	
0.03	0.0053	Const Calibração
0.04	0.0061	0.033283122
0.05	0.0074	
0.06	0.009	
0.07	0.0102	
0.08	0.0115	
0.09	0.0134	
0.1	0.0146	
0.13	0.0182	



Resultados

Parte B:



R1 = 6.25 ± 0.01 cm			R2 = 6.25 ± 0.01 cm					
X01 = 0 ± 0.01 cm			X02 = 6.25 ± 0.01 cm					
I = 0.5 ± 0.01 A								
Tabela 1 (Bobine 1)			Tabela 2 (Bobine 2)			Tabela 3 (B1+B2)		
x ± 0.01 cm	Vh ± 0.1 mV	B (mT)	x ± 0.01 cm	Vh ± 0.1 mV	B (mT)	x ± 0.01 cm	Vh ± 0.1 mV	B (mT)
1	3.1	1.03E-01	1	2.1	6.99E-02	1	5.0	1.66E-01
2	3.8	1.26E-01	2	2.5	8.32E-02	2	6.0	2.00E-01
3	4.7	1.56E-01	3	3.0	9.98E-02	3	7.3	2.43E-01
4	5.8	1.93E-01	4	3.7	1.23E-01	4	8.7	2.90E-01
5	6.9	2.30E-01	5	4.5	1.50E-01	5	10.0	3.33E-01
6	8.0	2.66E-01	6	5.6	1.86E-01	6	11.1	3.69E-01
7	8.6	2.86E-01	7	6.6	2.20E-01	7	12.0	3.99E-01
8	8.8	2.93E-01	8	7.6	2.53E-01	8	12.5	4.16E-01
9	8.6	2.86E-01	9	8.5	2.83E-01	9	12.9	4.29E-01
10	7.7	2.56E-01	10	8.8	2.93E-01	10	12.8	4.26E-01
11	6.7	2.23E-01	11	8.6	2.86E-01	11	12.5	4.16E-01
12	5.6	1.86E-01	12	8.0	2.66E-01	12	12.1	4.03E-01
13	4.6	1.53E-01	13	7.1	2.36E-01	13	11.2	3.73E-01
14	3.8	1.26E-01	14	6.0	2.00E-01	14	10.1	3.36E-01
15	3.0	9.98E-02	15	4.9	1.63E-01	15	8.7	2.90E-01
16	2.5	8.32E-02	16	4.0	1.33E-01	16	7.2	2.40E-01
17	2.1	6.99E-02	17	3.3	1.10E-01	17	6.1	2.03E-01
18	1.7	5.66E-02	18	2.8	9.32E-02	18	5.0	1.66E-01



Conclusão