

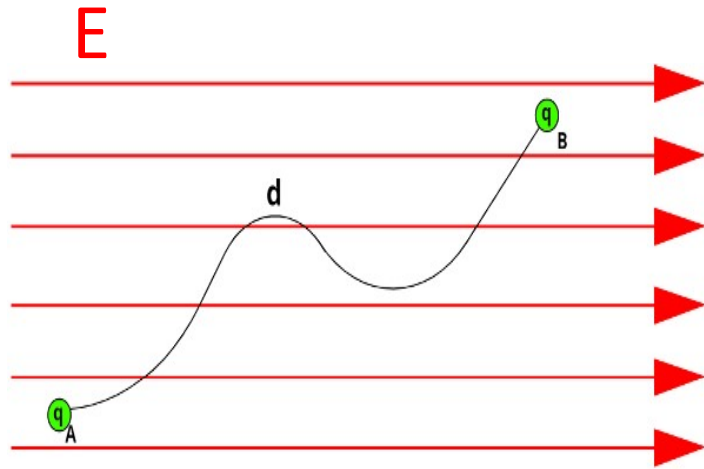
Física Experimental 3

Prática 5

Superfícies Equipotenciais

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Conceitos teóricos: O Potencial Elétrico (ΔV)



$$\Delta V = \frac{\Delta U}{q} = -\frac{W}{q}$$

Unidades:

ΔV – Volt (V)

E – V/m

$$\Delta V = - \int_a^b \frac{\vec{F} \cdot d\vec{s}}{q} = - \int_a^b \frac{q\vec{E} \cdot d\vec{s}}{q}$$

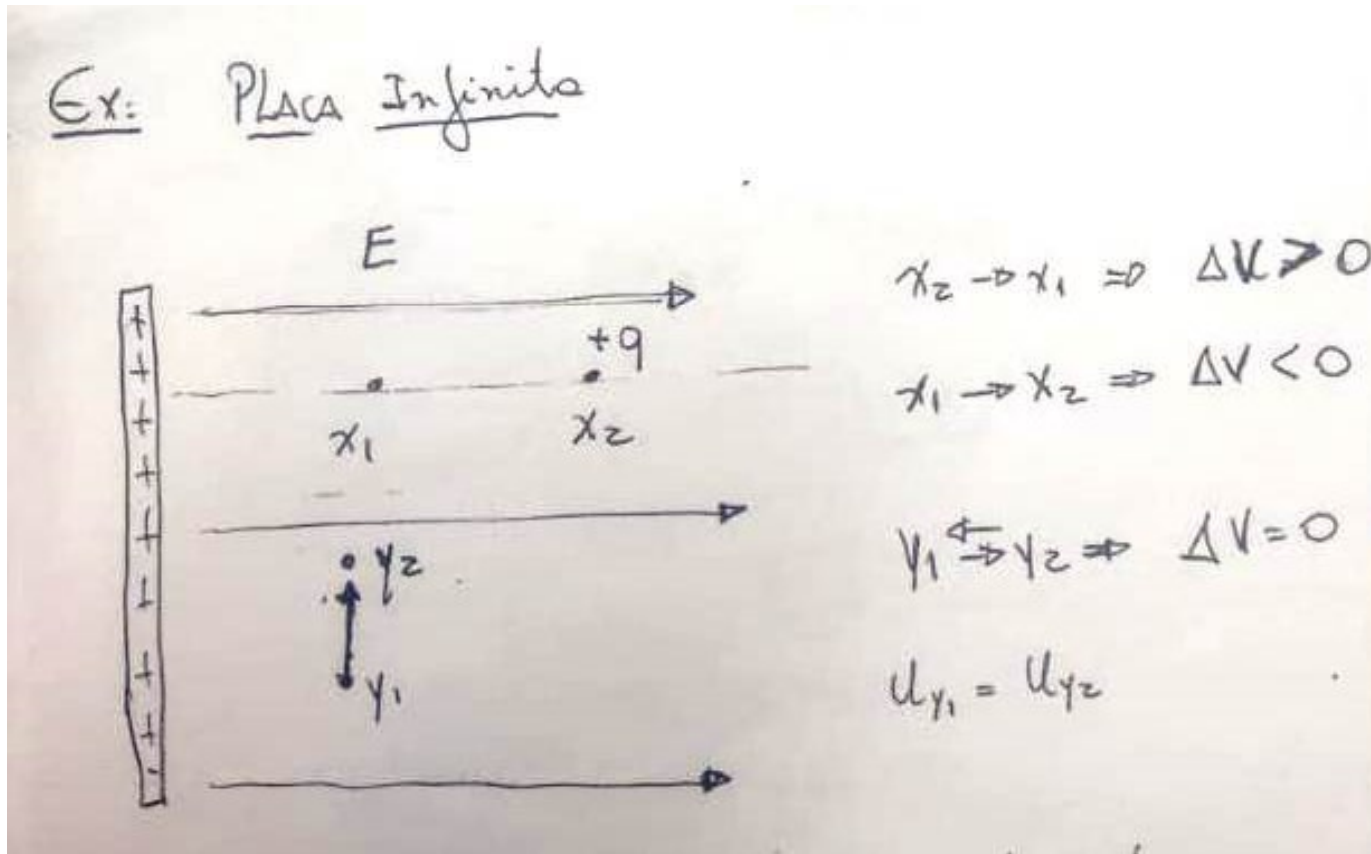
$$\Delta V = - \int_a^b \vec{E} \cdot d\vec{s}$$

P/ $E = \text{const.}$

$$\Rightarrow \Delta V = \vec{E} \Delta s$$

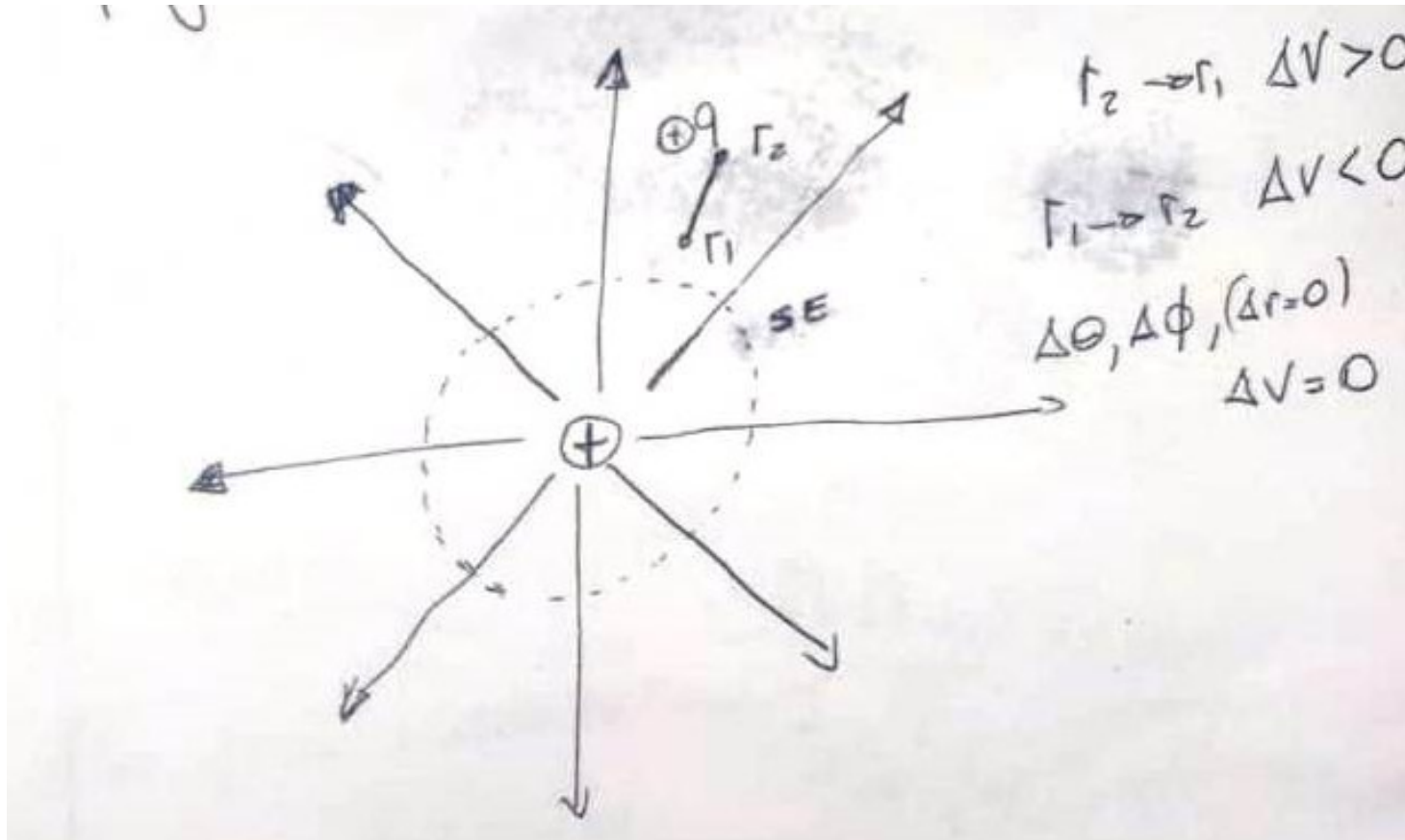
Conceitos teóricos:

Superfície Equipotencial: são formadas por pontos vizinhos que possuem o mesmo potencial elétrico.



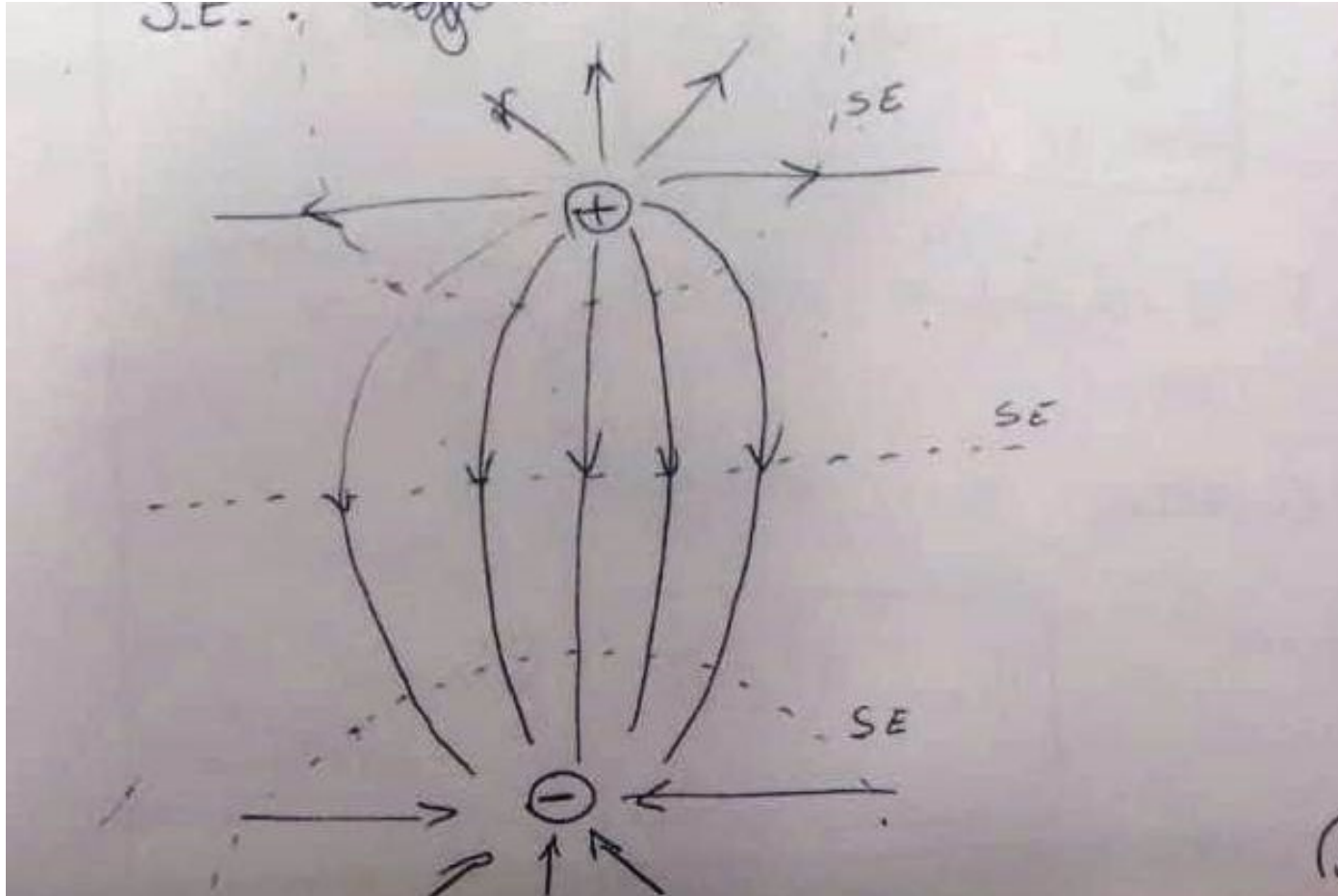
Planos paralelos a placa forma superfícies equipotenciais!

Conceitos teóricos: Carga puntual



Planos paralelos em geral são sempre perpendiculares as linhas de campo E.

Conceitos teóricos: Dipolo elétrico

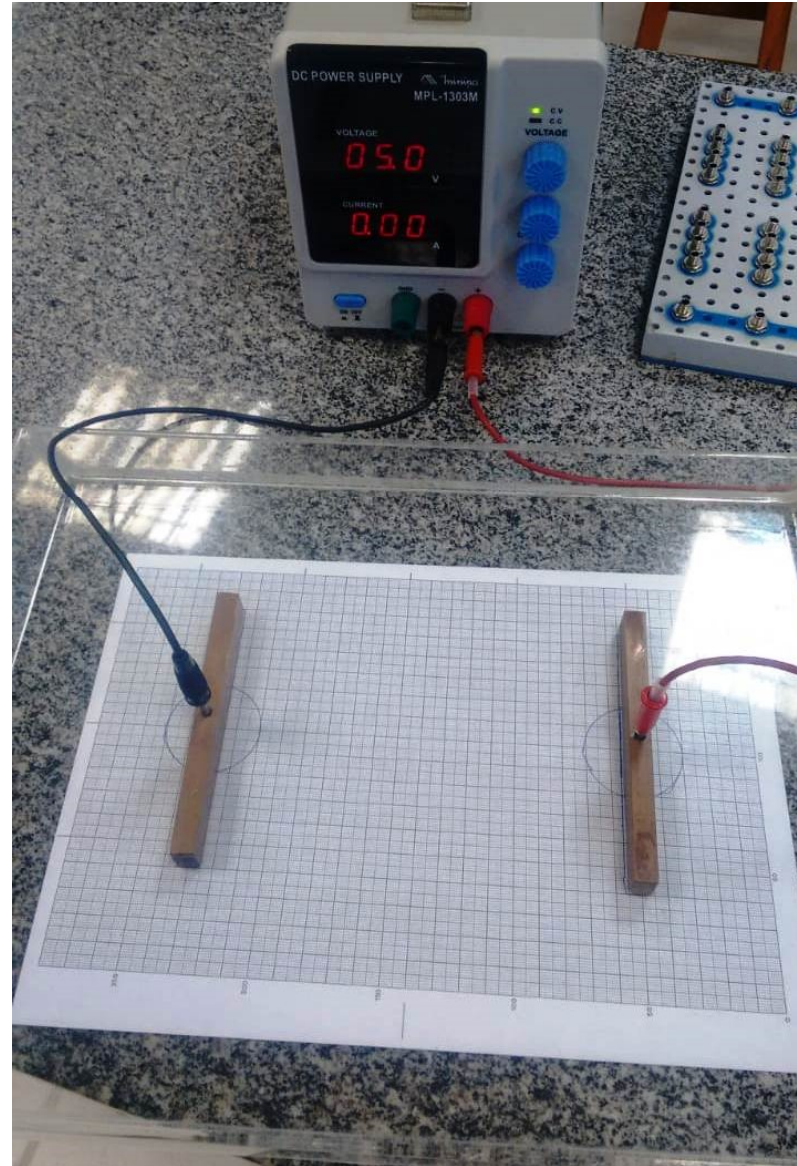


Planos paralelos em geral são sempre perpendiculares as linhas de campo E.

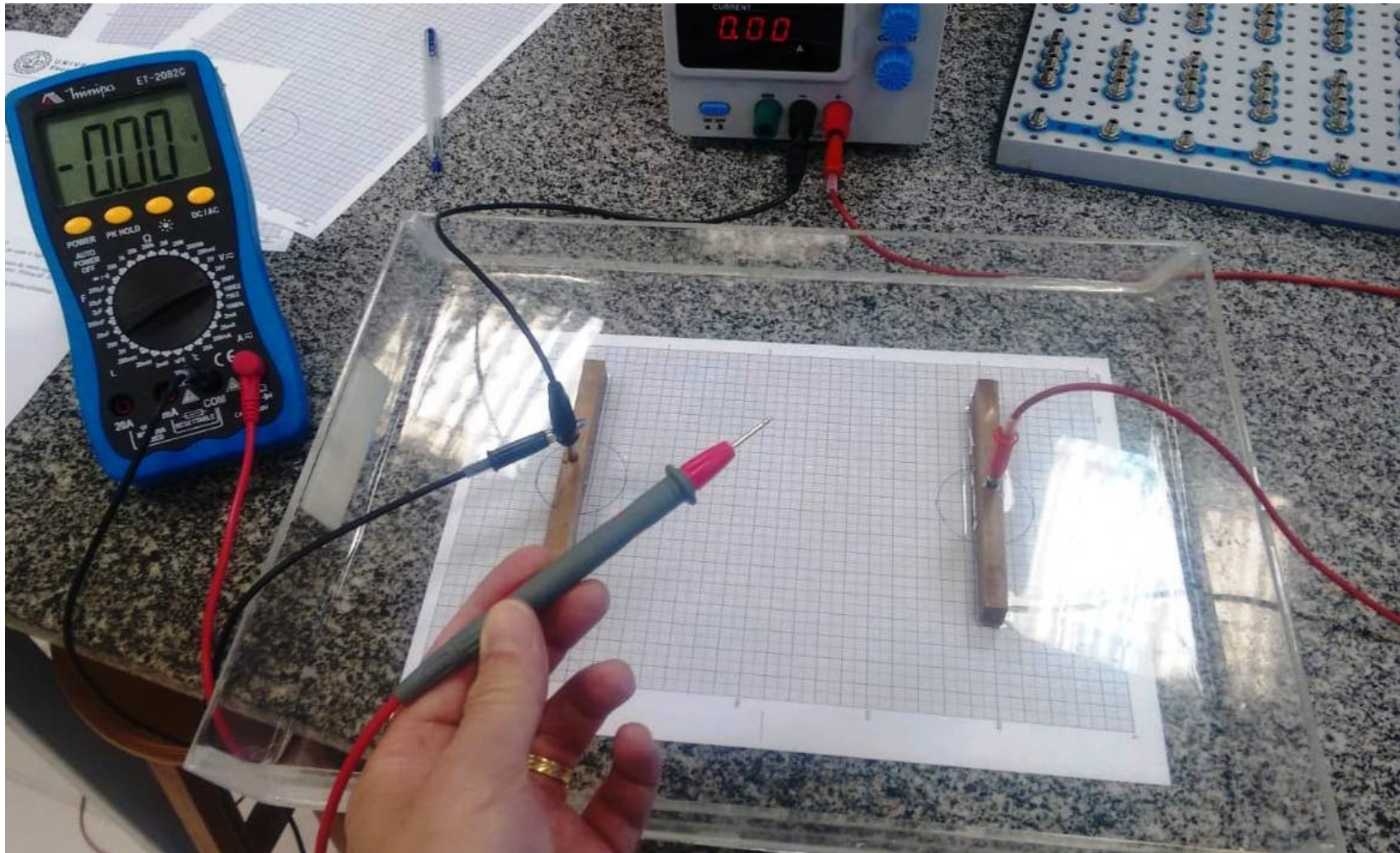
Objetivos

- Visualizar superfícies equipotenciais;
- Determinar campo elétrico através das superfícies equip.

Experimento – Barras retangulares

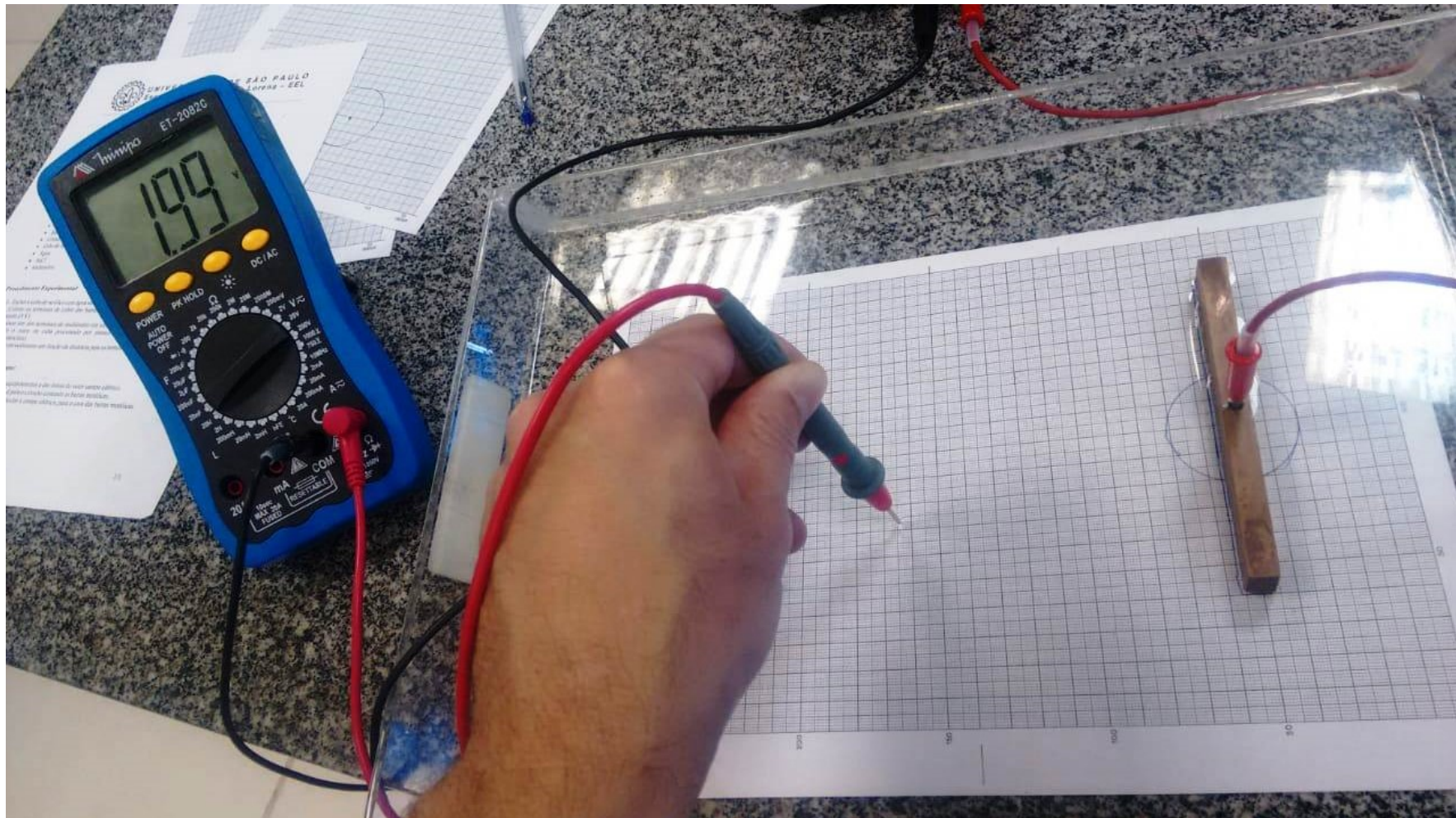


Experimento – Barras retangulares



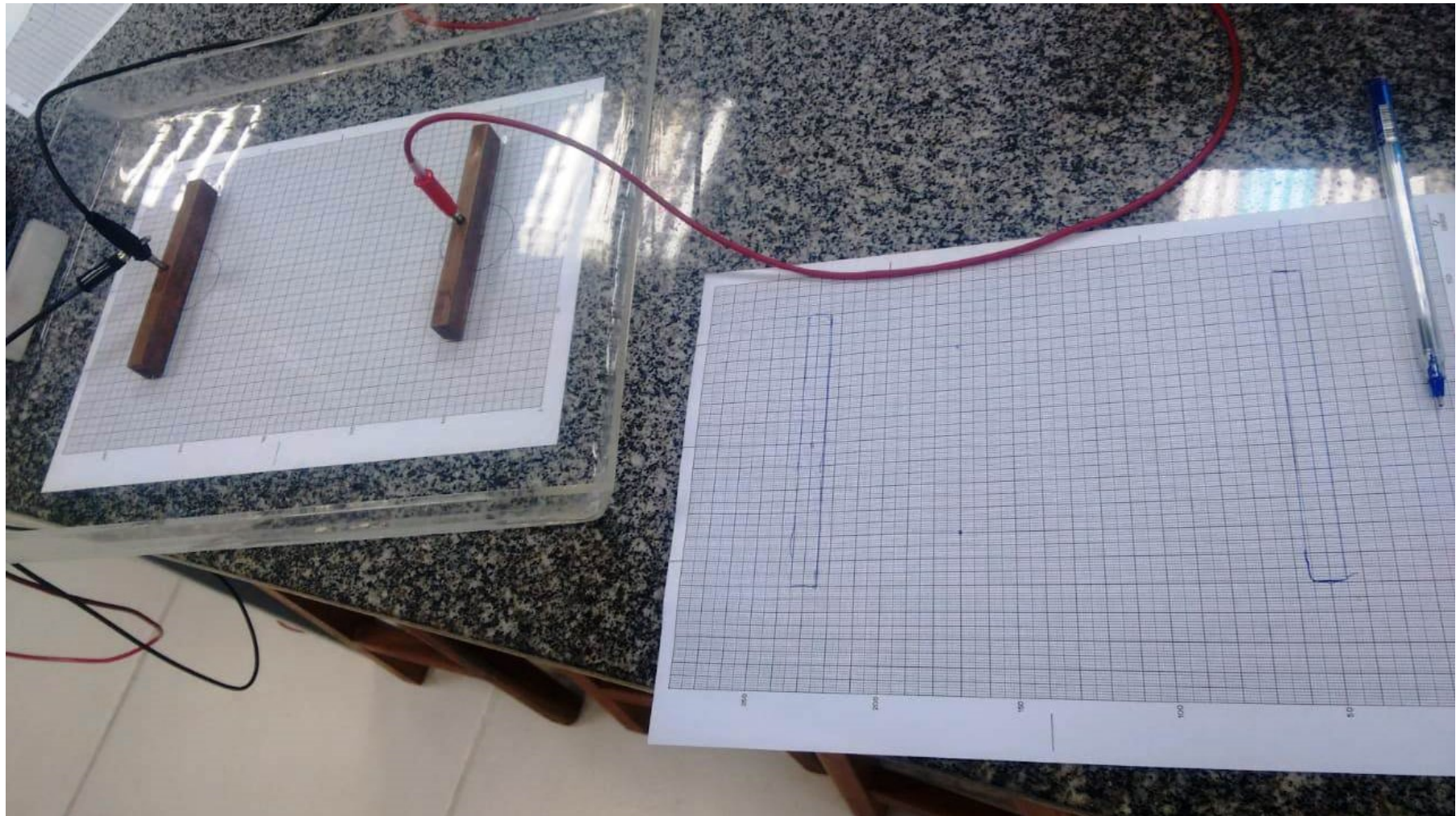
Experimento – Barras retangulares

Medidas do potencial com ponta de prova



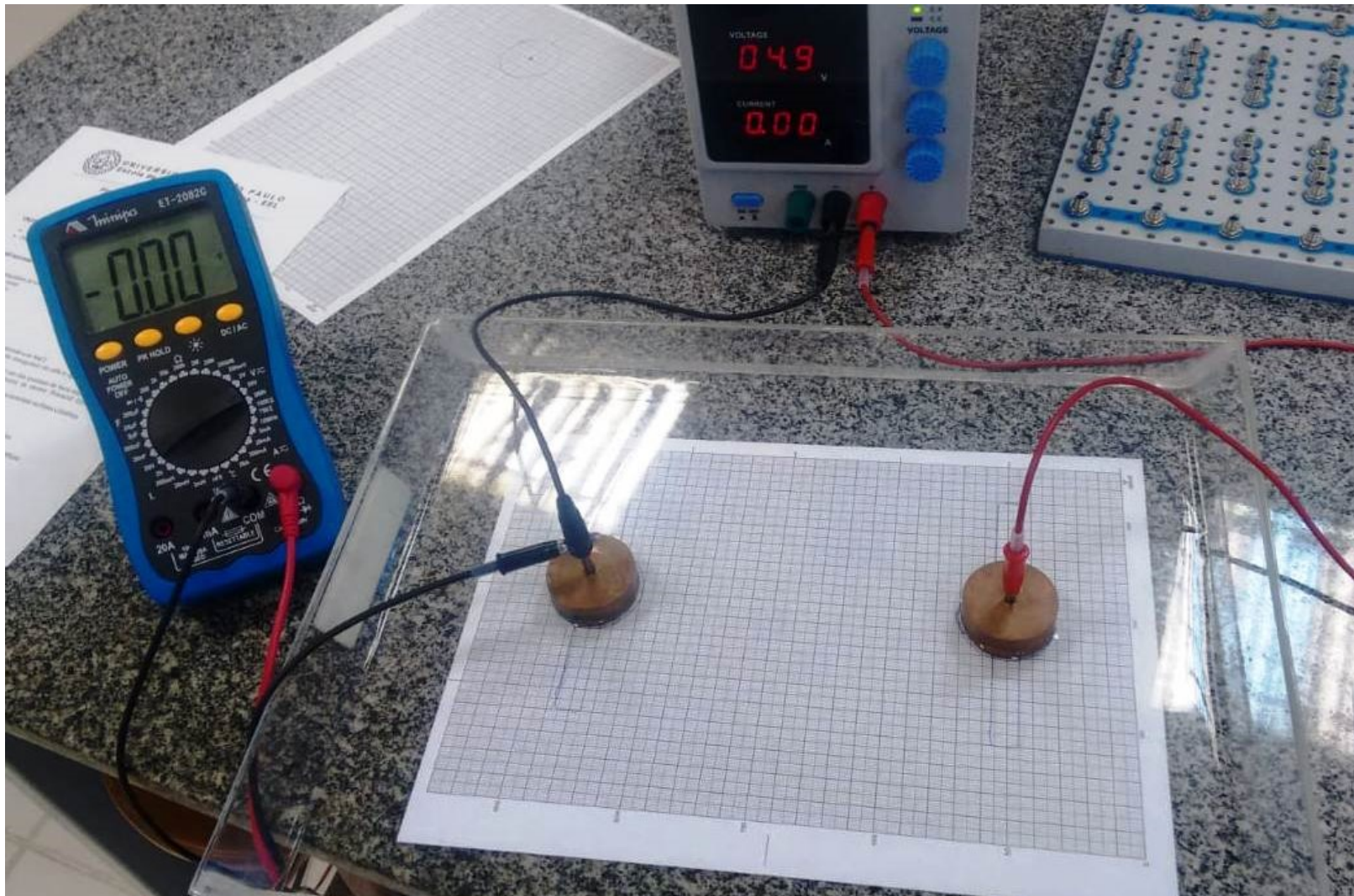
Experimento – Barras retangulares

Medidas do potencial com ponta de prova



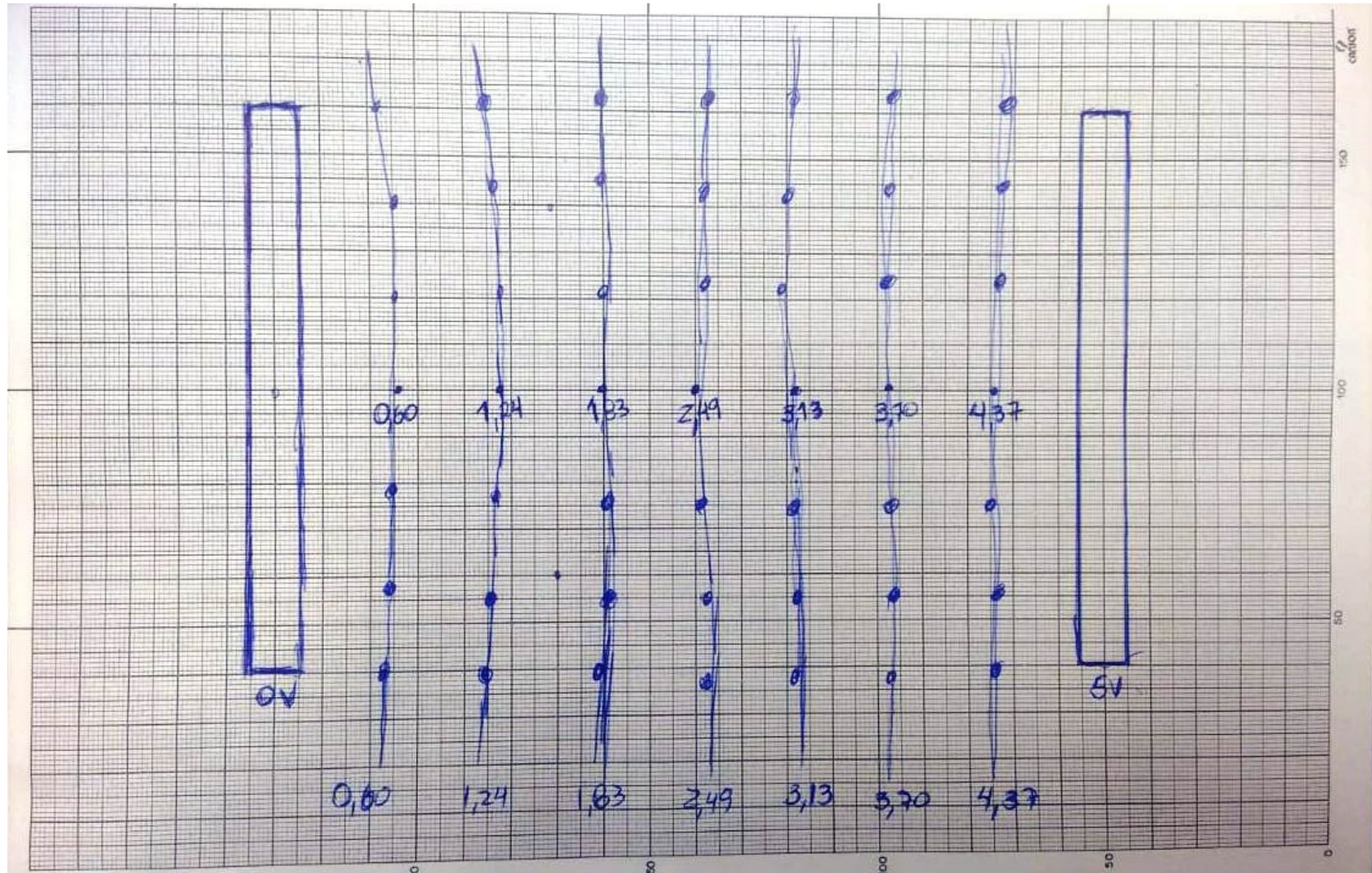
Experimento – Cilindros

Medidas do potencial com ponta de prova



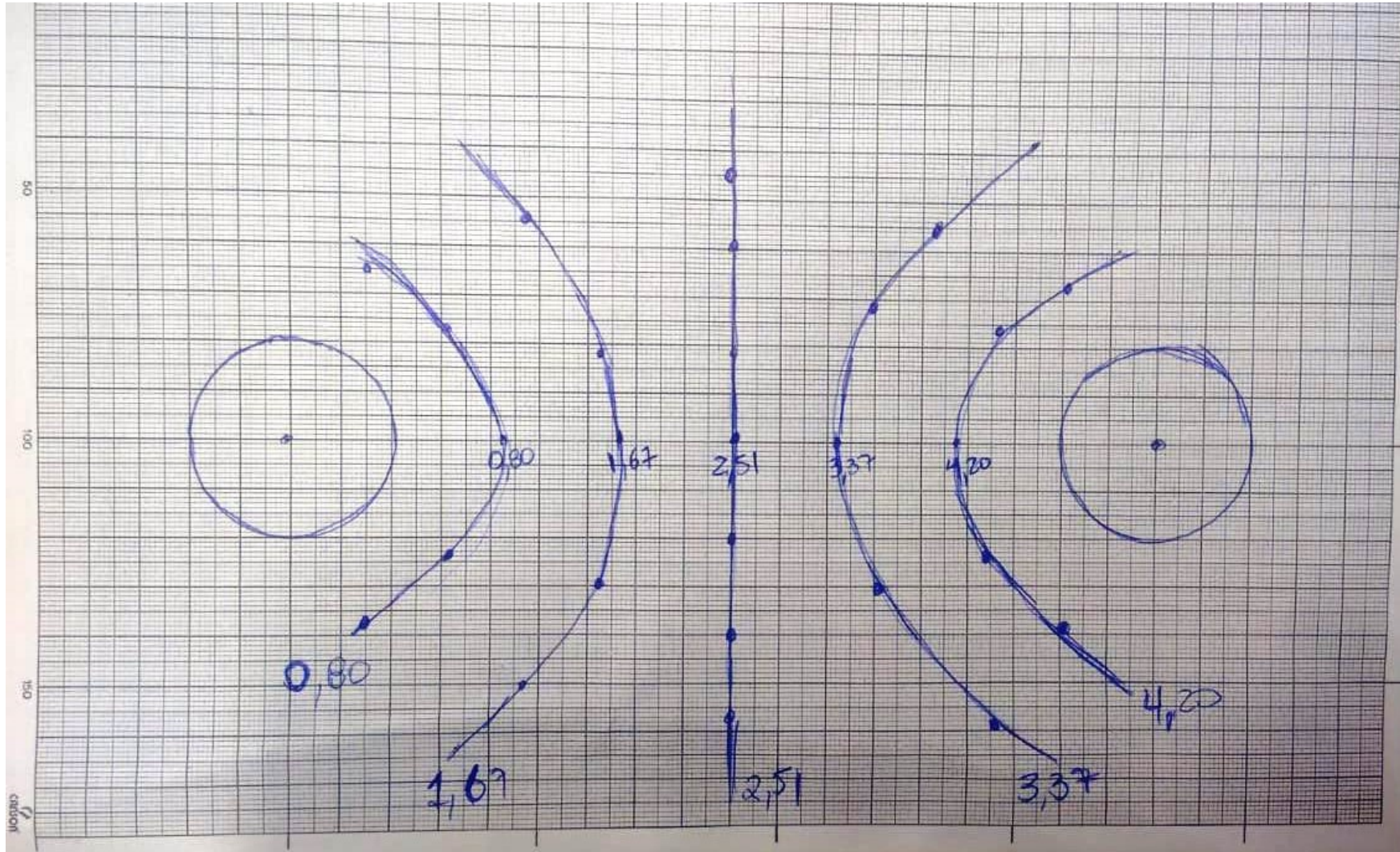
Resultados – Barras retangulares

Medidas do potencial com ponta de prova



Resultados – Barras retangulares

Medidas do potencial com ponta de prova



Trabalho

- Folhas milimetradas em anexo , escala da folha $10 \text{ mm} = 1 \text{ cm}$;
- Desenhar linhas de campo E;
- Fazer gráfico de V (eixo y) x S (eixo x) apenas para o caso das barras retangulares;
- Determinar campo E através do gráfico.

- Entrega: 16/ 06

Trabalho

- Linearizar tabela de dados para o descarregamento do capacitor e determinar a Capacitância;

The image shows a handwritten derivation on a piece of paper. It starts with the equation for the voltage across a capacitor during discharge: $V(t) = V_0 e^{-t/RC}$. This equation is then taken to the natural logarithm to linearize it: $\ln(V(t)) = \ln V_0 - \frac{t}{RC}$. Brackets are drawn under $\ln V_0$ and $-\frac{t}{RC}$ to identify the intercept and slope of a linear plot. This is then written in the form of a linear equation: $Y(t) = a - bt$. Finally, the angular coefficient is identified as $b = \frac{1}{RC}$.

$$V(t) = V_0 e^{-t/RC}$$
$$\ln(V(t)) = \ln V_0 - \frac{t}{RC}$$
$$Y(t) = a - bt$$

coef. Angular $b = \frac{1}{RC}$