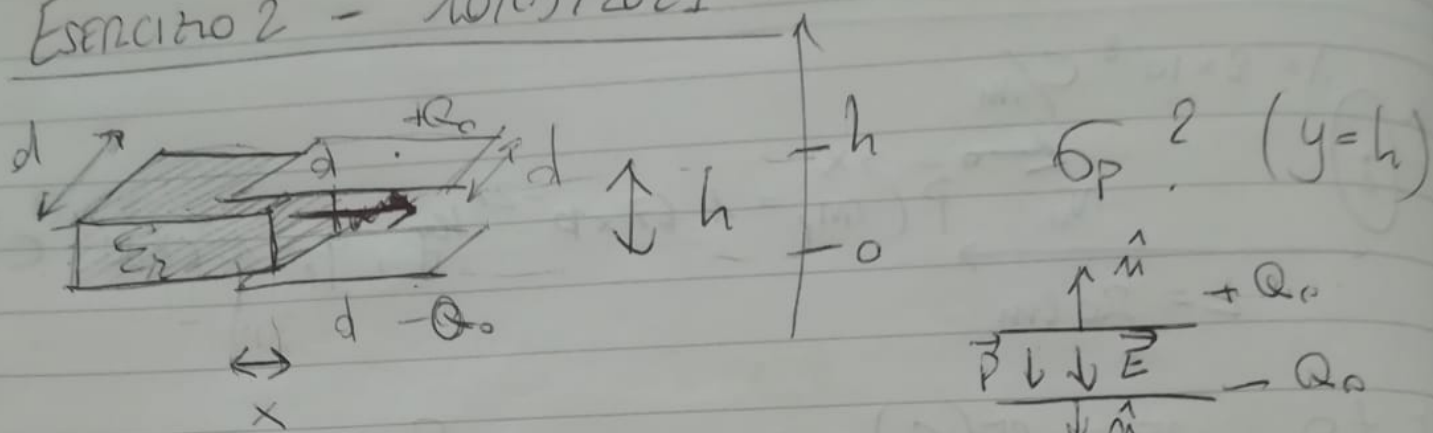


Esercizio 2 - 10/09/2021



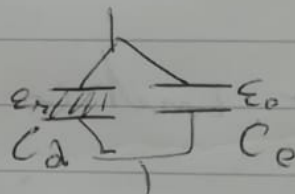
$$\Delta V(x) = \frac{Q_0}{C(x)}; \quad \vec{P} \cdot \hat{m} = \sigma_p \quad \sigma_p(y=h) = -P$$

Per un dielettrico lineare ~~non~~ $\vec{P} = (\epsilon_r - 1) \epsilon_0 \vec{E}$

$$|\vec{E}(x)| = \frac{\Delta V(x)}{h} \quad \text{costante sul condensatore piano}$$

$$\Rightarrow E(x) = \frac{\Delta V(x)}{h} = \frac{Q_0 / C(x)}{h} = \frac{Q_0}{h C(x)}$$

$$C(x) = C_0 + C_d$$



$$C(x) = \frac{d(d-x)}{h} \epsilon_0 + \frac{d \cdot x \cdot \epsilon_r \epsilon_0}{h} = \frac{d \epsilon_0}{h} [(d-x) + x \epsilon_r]$$

$$= \frac{d \epsilon_0}{h} [x(\epsilon_r - 1) + d]$$

$$\Rightarrow \sigma_p(y=h) = -P = -(\epsilon_r - 1) \epsilon_0 E = -\frac{(\epsilon_r - 1) \epsilon_0 Q_0}{h C(x)}$$

$$= -\frac{(\epsilon_r - 1) \epsilon_0 Q_0}{h} \frac{h}{d \epsilon_0 [x(\epsilon_r - 1) + d]} = -\frac{(\epsilon_r - 1) Q_0}{d [x(\epsilon_r - 1) + d]}$$