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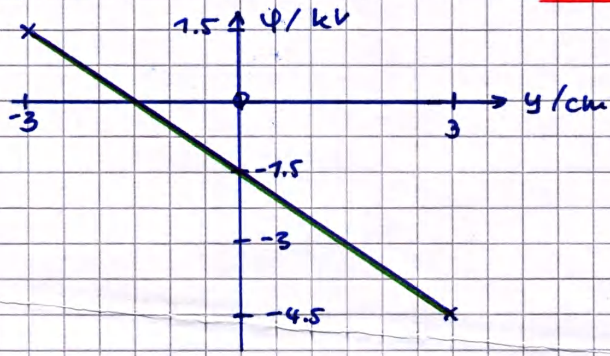
2.1 $U_{P_2 P_1} = \varphi(P_2) - \varphi(P_1) \Leftrightarrow \varphi(P_2) = U_{P_2 P_1} + \varphi(P_1)$

$\varphi(P_2) = 6{,}0\,kV - 4{,}5\,kV = \underline{1{,}5\,kV}$

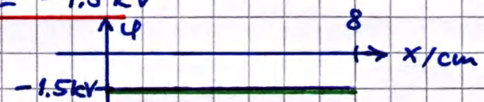


Im homogenen Feld: linearer Pot.-Verlauf

2.2 Äquipotentialflächen sind parallel zu den Platten.

$\Rightarrow$ Für $y=0$ ist $\varphi(x) = \text{konst}$, da in einer Äquipot.-fl.

Aus 2.1: $\varphi(y=0) = \underline{\varphi(x) = -1{,}5\,kV}$



2.3 $E = \frac{|U|}{d} = \frac{U_{P_2 P_1}}{d} = \frac{6{,}0\,kV}{0{,}060\,m} = \underline{1{,}0 \cdot 10^5\,\frac{V}{m}}$

Richtung <u>parallel zur y-Achse</u>; Orient. in Richtung abnehmendes Potential, also in <u>pos. y-Richtung</u>

2.4.1

$y = \frac{1}{2} a t^2 \quad ; \quad ma = F_{el} = qE \left(= q \cdot \frac{U}{d}\right) \Leftrightarrow a = \frac{q \cdot E}{m}$

$x = v_0 t \Leftrightarrow t = \frac{x}{v_0} = \frac{\ell}{v_0}$

$y = \frac{1}{2} \cdot \frac{q \cdot E}{m} \cdot \left(\frac{\ell}{v_0}\right)^2 = \frac{1}{2} \cdot \frac{1{,}6 \cdot 10^{-19}\,As \cdot 1.0 \cdot 10^5\,\frac{V}{m}}{1{,}673 \cdot 10^{-27}\,kg} \cdot \left(\frac{0{,}080\,m}{1.1 \cdot 10^6\,m/s}\right)^2$

$\underline{y = 2{,}5\,cm}$

2.4.2 $v_y: \frac{1}{2} m v_y^2 = F_{el} \cdot y = q \cdot E \cdot y \Leftrightarrow v_y^2 = \frac{2 \cdot qEy}{m}$

$v^2 = v_x^2 + v_y^2 = v_0^2 + v_y^2 = v_0^2 + \frac{2qEy}{m}$

$v = \left[\left(1{,}1 \cdot 10^6\,\frac{m}{s}\right)^2 + \frac{2 \cdot 1{,}6 \cdot 10^{-19}\,As \cdot 1{,}0 \cdot 10^5\,V/m \cdot 0{,}025\,m}{1.673 \cdot 10^{-27}\,kg}\right]^{1/2}$

$= \underline{1{,}3 \cdot 10^6\,\frac{m}{s}}$