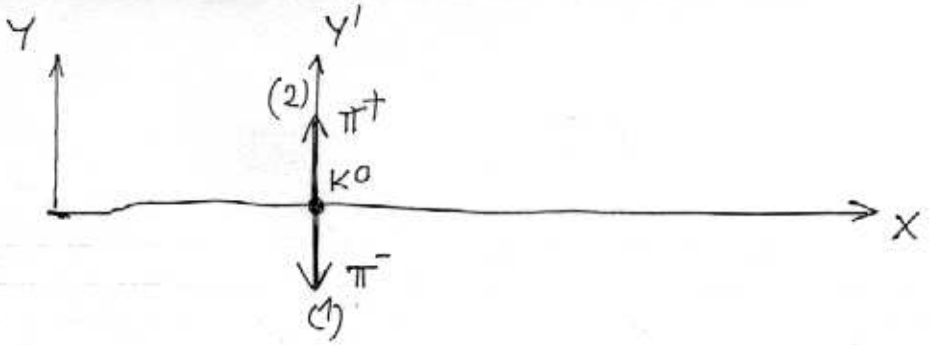
ZAD 4B

$c=1$



$E = 2m_K$

$\gamma_K = \frac{E}{m_K} = 2$

$\beta_K = \frac{\sqrt{E^2 - m_K^2}}{2m_K} = \sqrt{\frac{3}{4}} = 0{,}866$

Obliczamy pędy mezonów π w układzie spoczynkowym K^0

$m_K = E_1^* + E_2^* = 2\sqrt{m_\pi^2 + p^2}$

$\frac{m_K^2}{4} = m_\pi^2 + p^2 \qquad p = \sqrt{\frac{m_K^2 - 4m_\pi^2}{4}} = 205.9 \text{ MeV/c}$

$E_1^* = \frac{m_K}{2} = E_2^* = 249.0 \text{ MeV/c}$

Czteropędy w ukł. K^0

$p_1^* = (E_1^*, 0, p, 0) \qquad p_2^* = (E_1^*, 0, -p, 0)$

Transformacja do LAB

$p_{1x} = \gamma_K(\cancel{p_{1x}^*}^{=0} + \beta_K E_1^*) \qquad p_{2x} = \gamma_K(\cancel{p_{1x}^*}^{=0} + \beta_K E_1^*)$

$p_{1y} = p_{1y}^* = p \qquad p_{2y} = p_{2y}^* = -p$

$E_1^* = \gamma_K(E_1^* + \cancel{\beta_K p_{1x}^*}^{0}) \qquad E_2^* = \gamma_K(E_2^* + \beta_K \cancel{p_{2x}^*}^{=0})$

$p_{1x} = \gamma_K \beta_K E_1^*$	$= 431.3$ MeV	$p_{2x} =$	431.3 MeV
$p_{1y} = p$	$= 205.9$ MeV	$p_{2y} =$	-205.9 MeV
$E_1 = m_K$	$= 498.$ MeV	$E_2 = m_K =$	498

$\tan\theta_1 = \frac{p_{1y}}{p_{1x}} = 0.477 = -\tan\theta_2$

$\theta_1 = 25{,}52^\circ = -\theta_2$