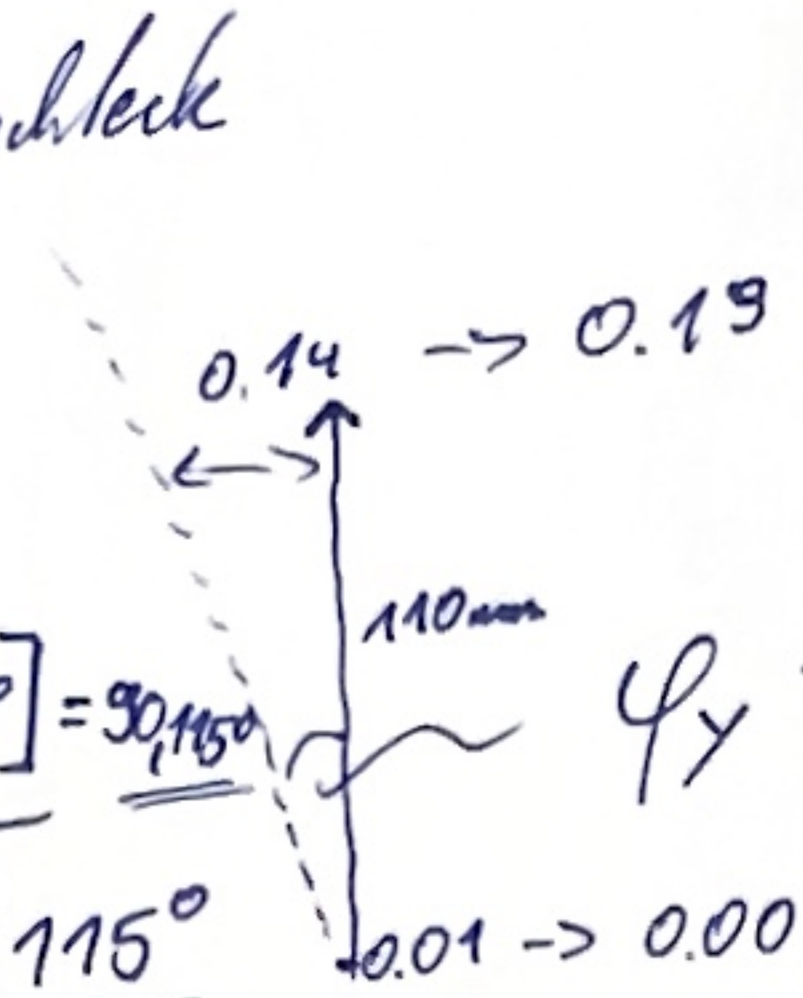
1. Messung XY orthogonalität

$90^\circ + [0{,}047^\circ + 0{,}068^\circ] = 90{,}115^\circ$

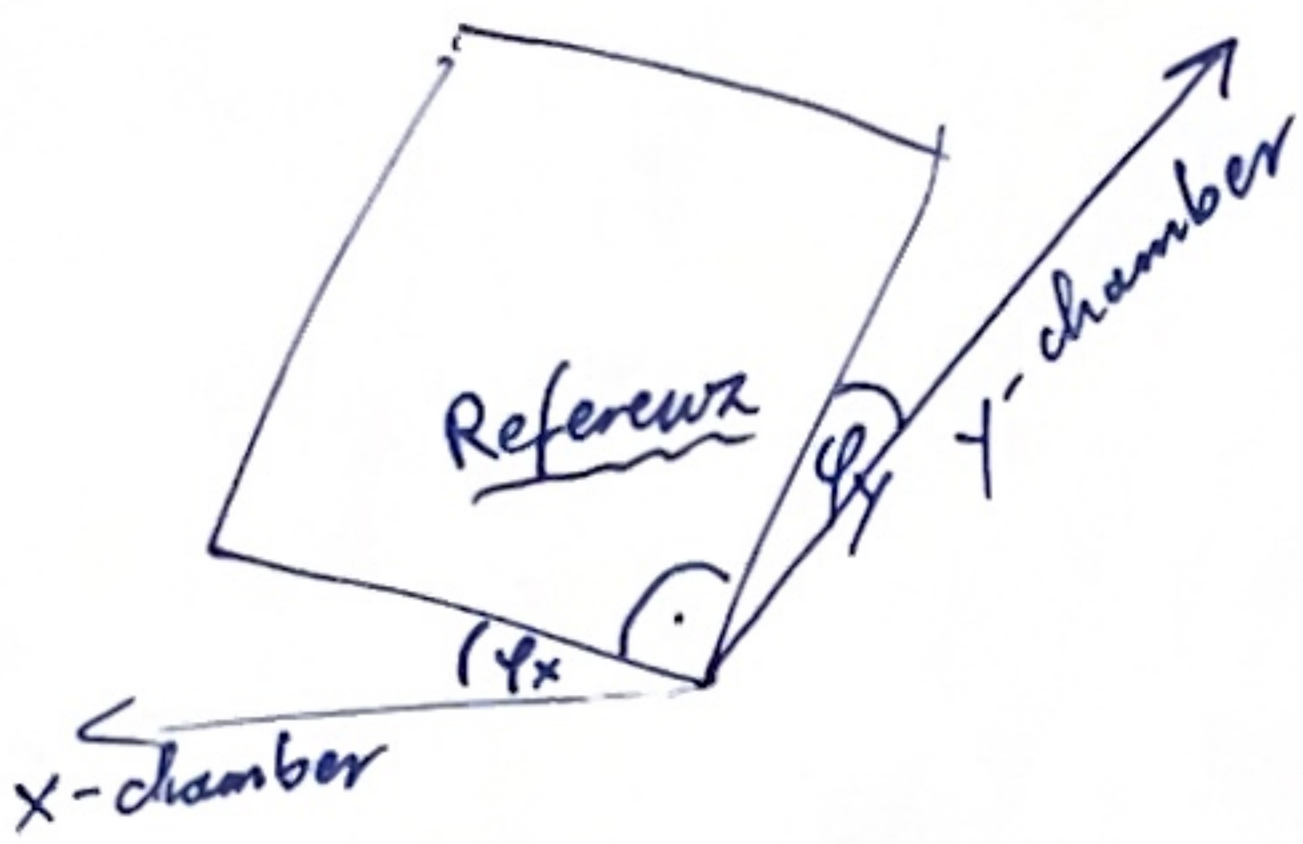
Winkelerror $\approx 0{,}115^\circ$

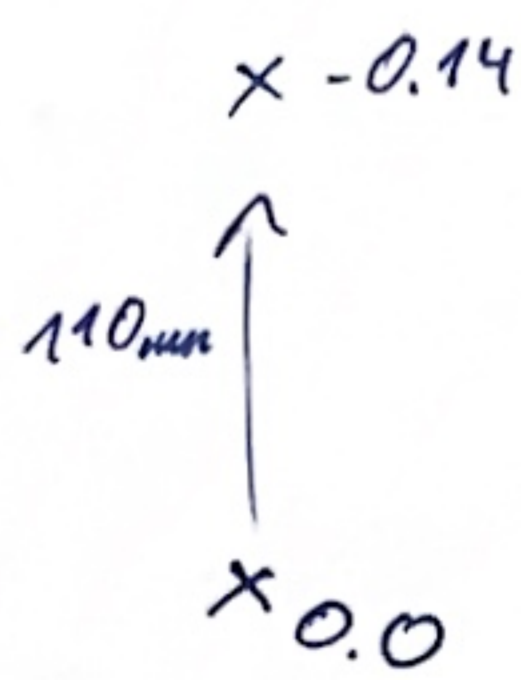


$\varphi_y = \arctan\left(\frac{0.13}{110}\right) = 0{,}067713^\circ$

↳ $0{,}068^\circ$

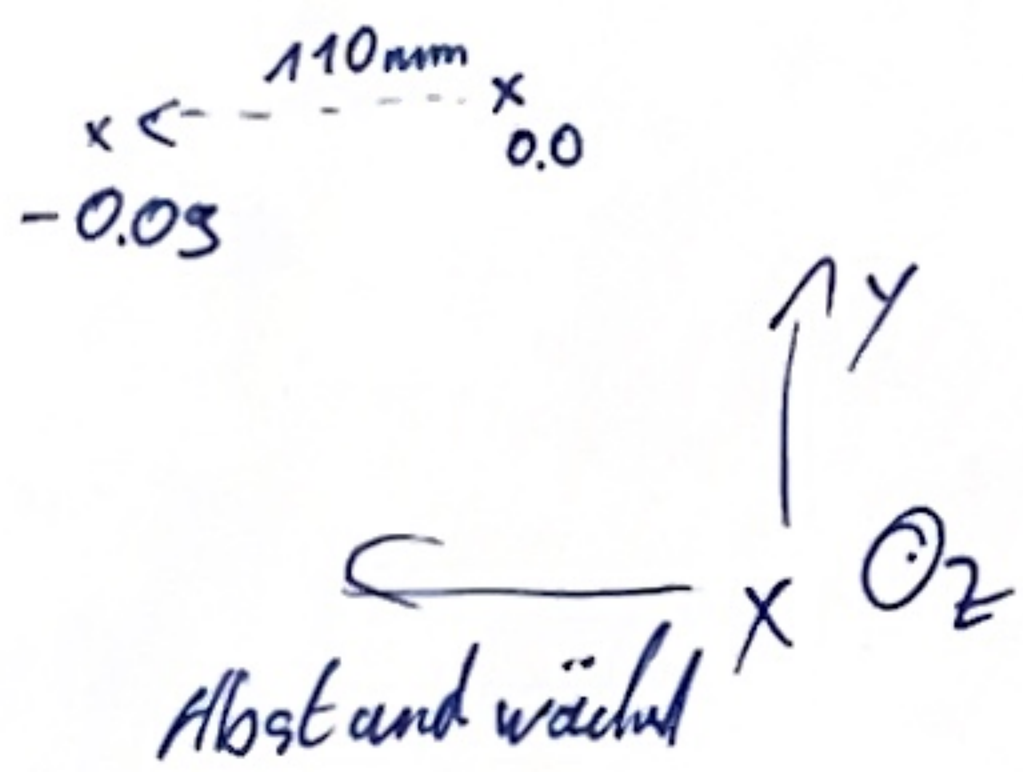
② y - Ausmessen





110 : -0.14
100 : -0,12
50 : -0.09
0 : 0.01

↑ Abstand wächst!



① x Ausrichten

$\varphi_x = \arctan\left(\frac{0{,}09}{110}\right) = 0{,}046878^\circ$

↳ $0{,}047^\circ$

(1.2) Winkel in KOS orientierung Referenz

>Note Auflösung Messuhr : 0.01 mm
Hebelarm/Achslänge : 110 mm

} Winkelauflösung $\approx 5{,}2 \times 10^{-3\,\circ} = 0{,}005^\circ$

2. Messung XY orthogonalität

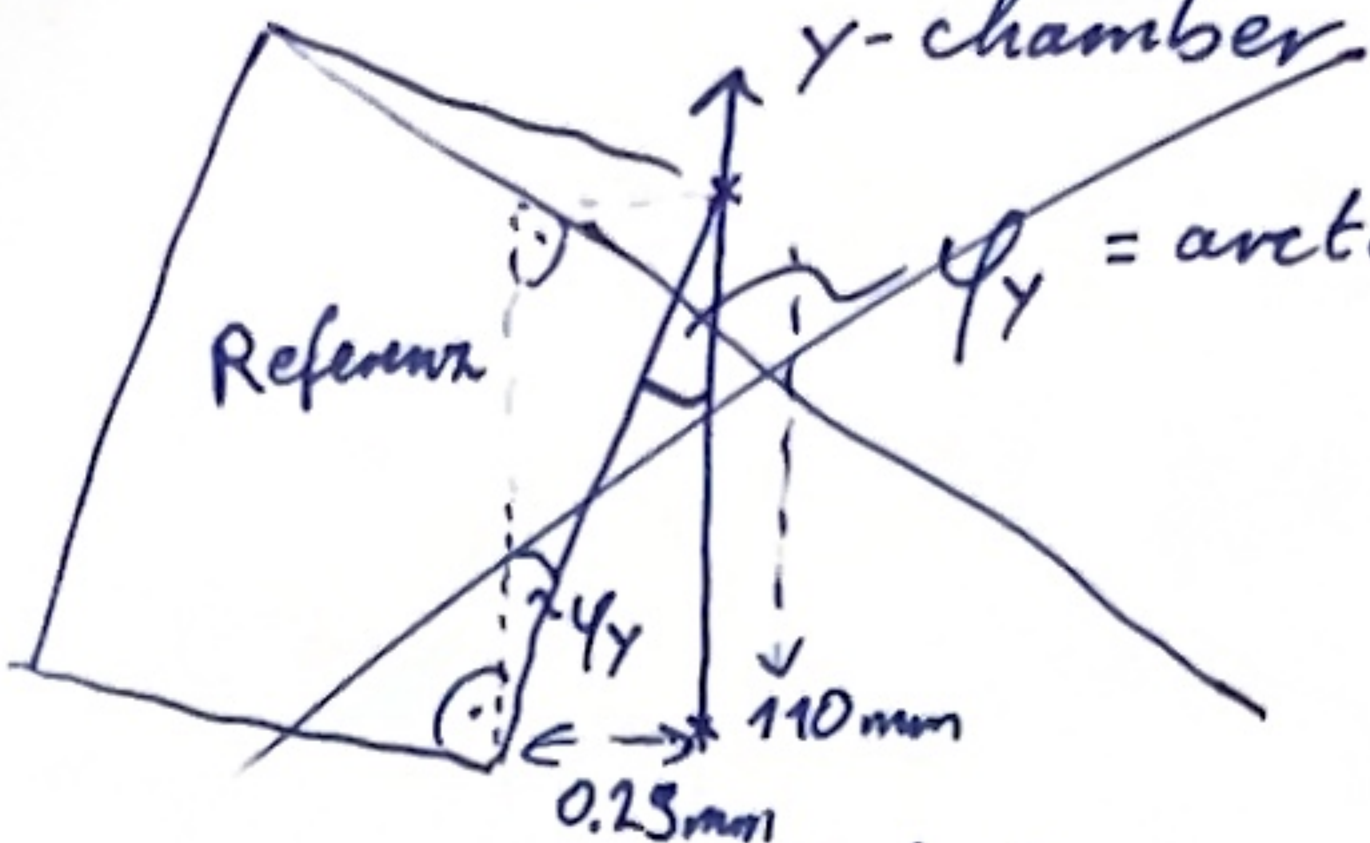
① Y-Ausrichten

0.0
× +0.05 → +0.00

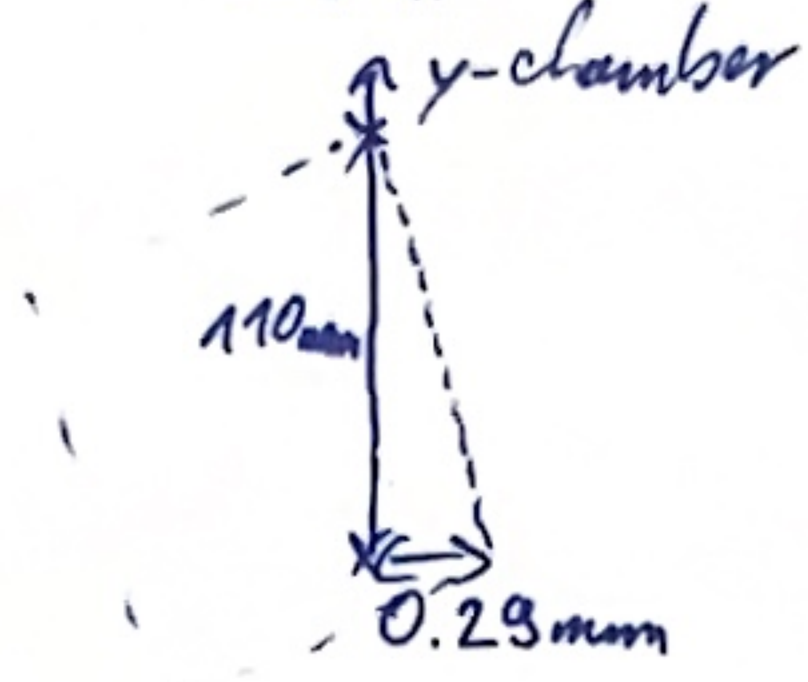
50: +0.18
100: +0.33

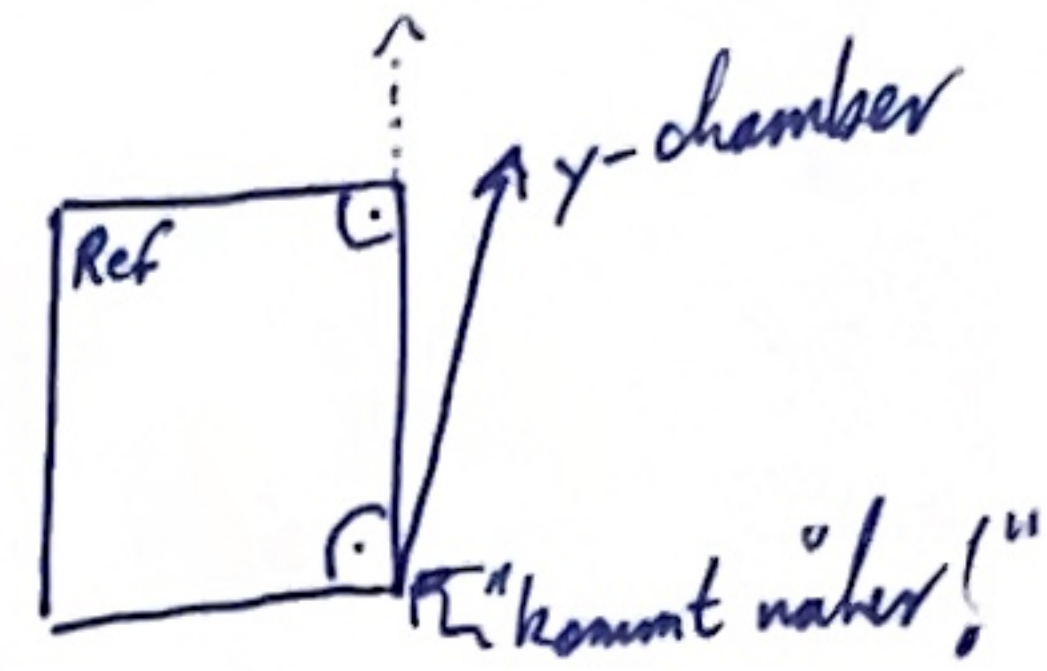
× +0,34 → +0.29
110mm

↳ Messrichtung! '+' ≙ kommt näher!



$\varphi_Y = \arctan\left(\frac{0.29}{110}\right) = 0{,}151°$



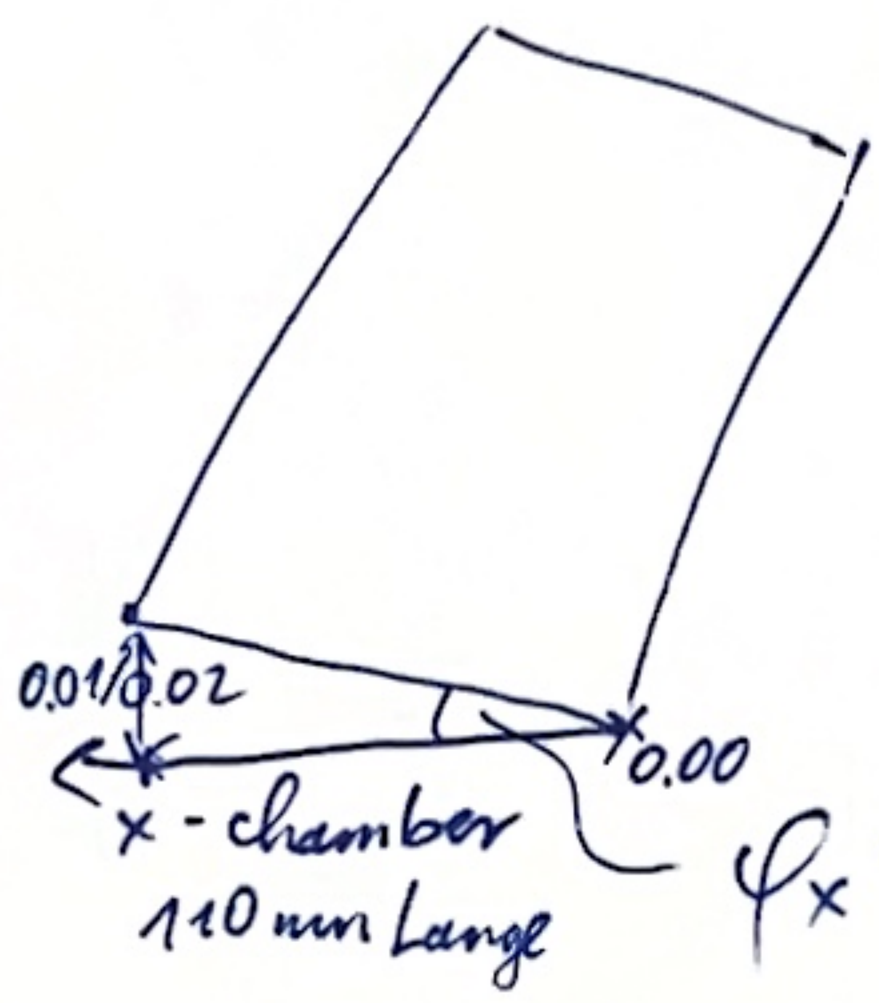


② X-Vermessen

110mm
× ← × 0.0

100 50

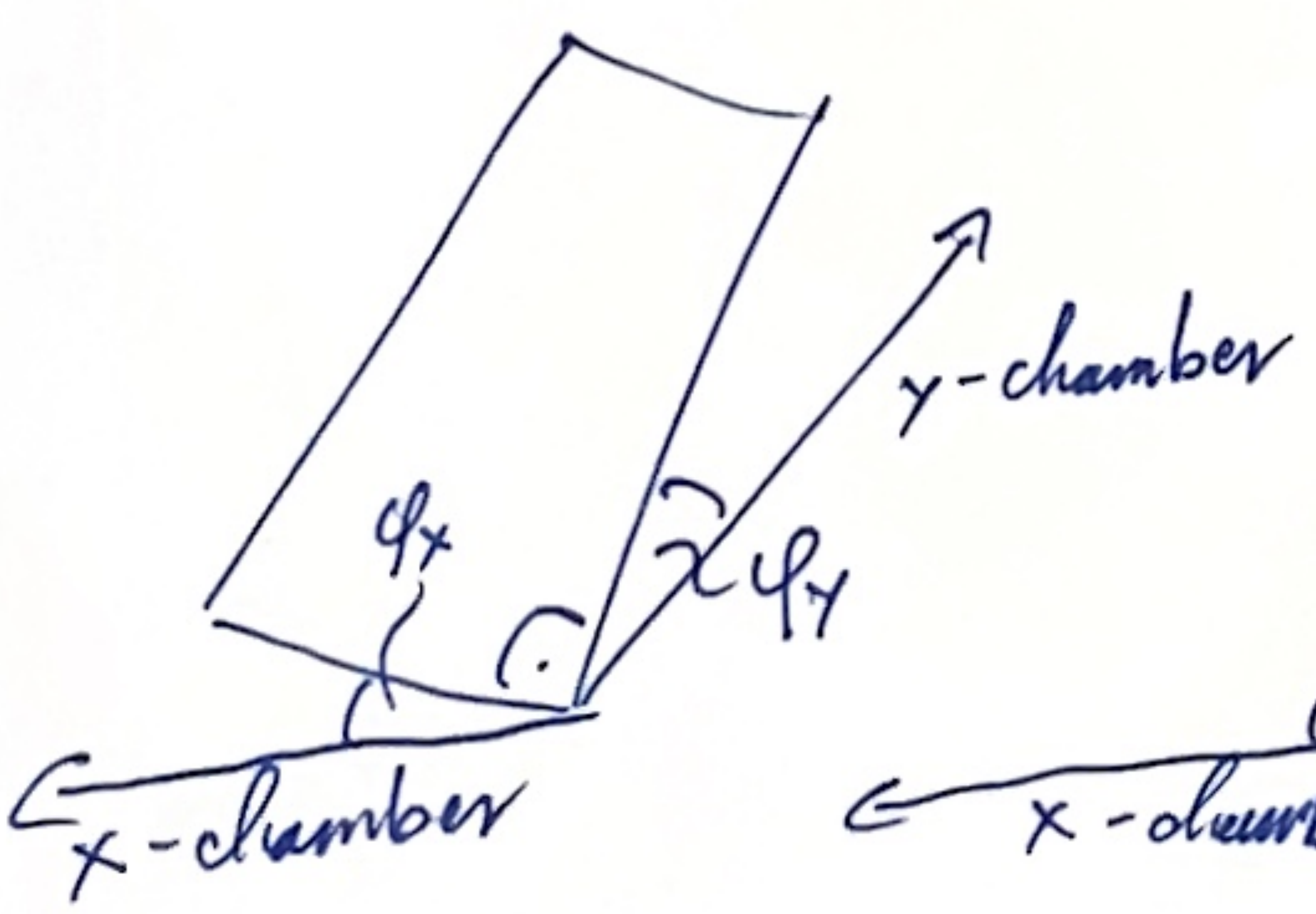
+0.07 → 0.00
50: +0.08
100: +0.09
110: +0.09 → (0.01 - 0,02)

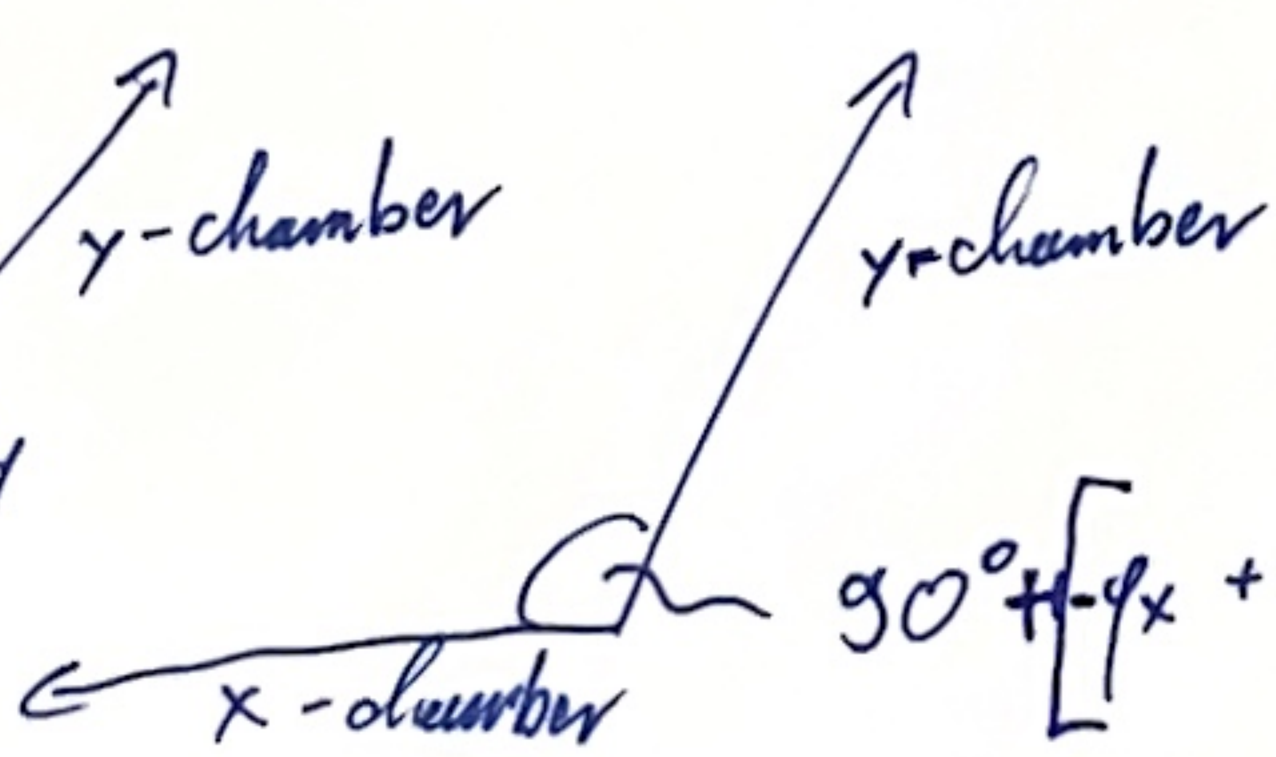


$\varphi_x = \arctan\left(\frac{0.02}{110}\right) = 0{,}01°$

[= 2 * Δφmin!]

③ Error berechnen





$90° + [-\varphi_x + \varphi_y] = 90° \, [-0{,}01° + 0{,}151°]$

Winkelerror ≈ 0,141°

! $\Delta\varphi_{min} = 0.005°$ ≈ 0.14°

Resultat:

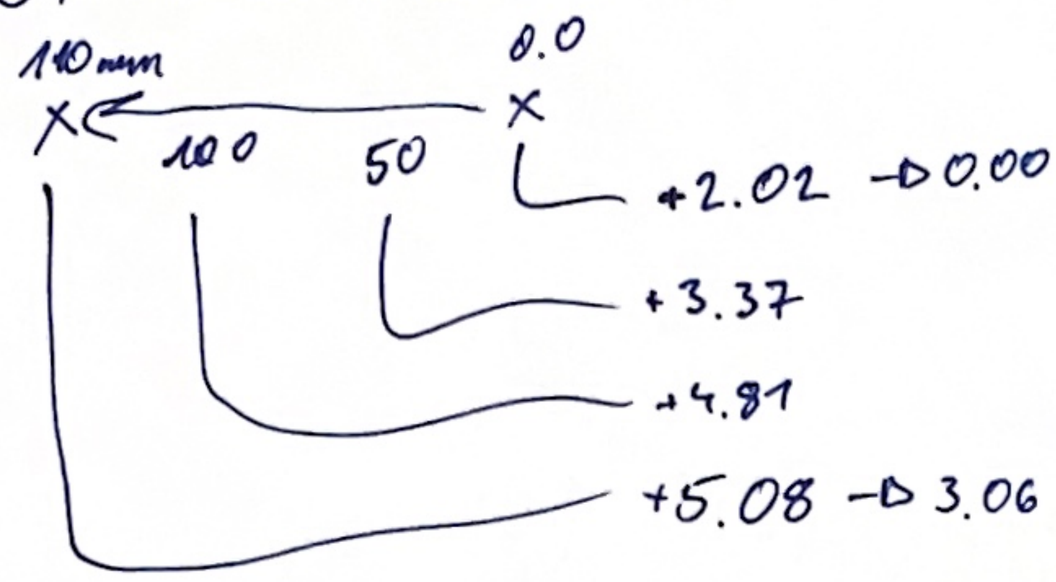
Erste Messung $\varphi_{XY} \approx 90.115°$ ⇒ $e_\varphi = +0.115°$

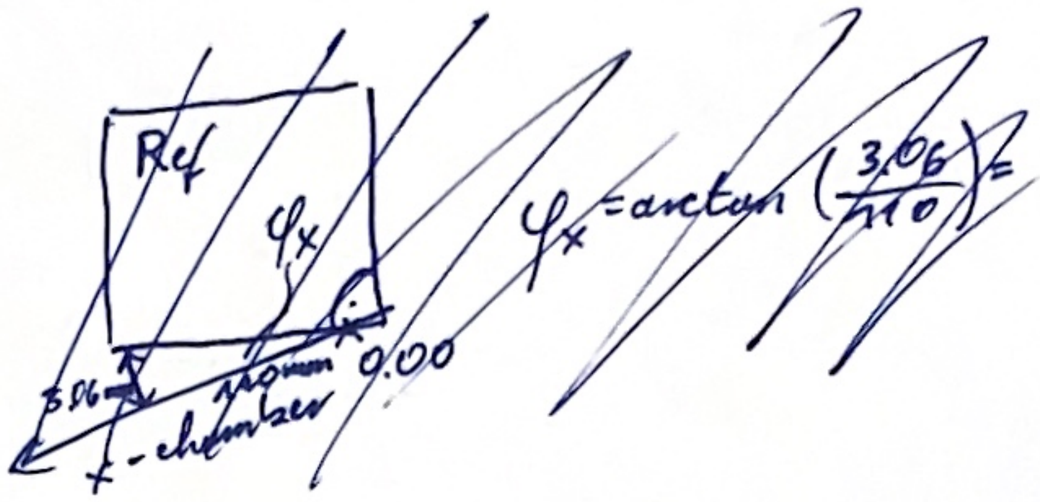
Zweite Messung $\varphi_{XY} = 90.140°$ ⇒ $e_\varphi = +0.14°$

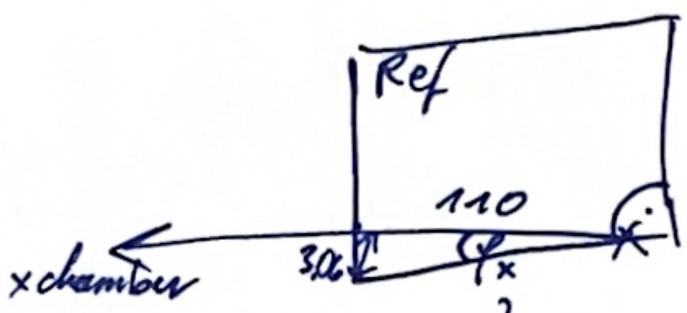
Dritte Messung $\varphi_{XY} = 90.24$ ⇒ $e_\varphi = +0.24°$

3. Messung X Orthogonalität

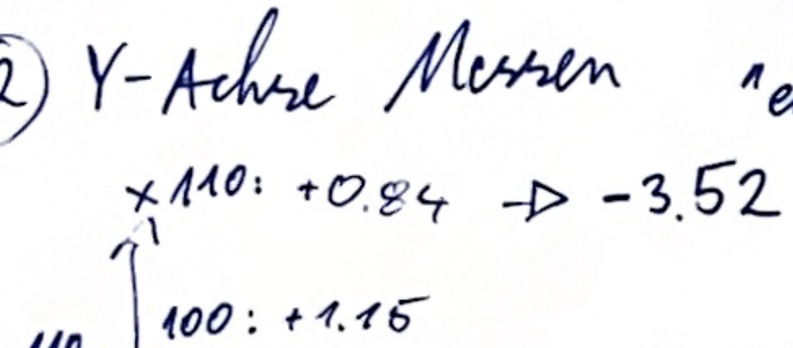
① X-Achse Messen "Kam näher!)



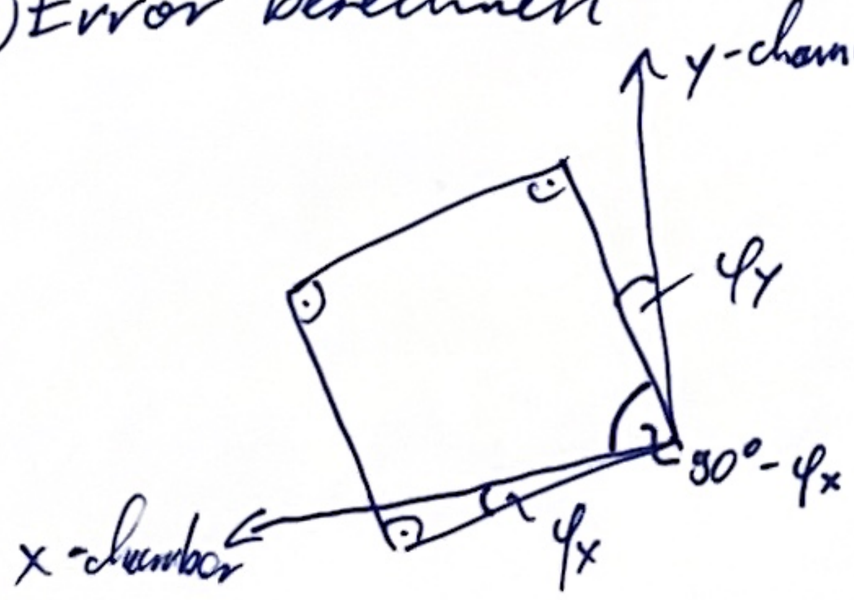




② Y-Achse Messen "entfernt sich!"



③ Error berechnen



$$\Rightarrow \varphi_{xy} = \varphi_y + 90° - \varphi_x = 90° + [-\varphi_x + \varphi_y]$$

$$= 90° + [-1.59345° + 1.8328°]$$

$$= 90° + 0.23935°$$

$$\approx 90,24°$$