Optik

Berechnung an einzelner spärischer Fläche

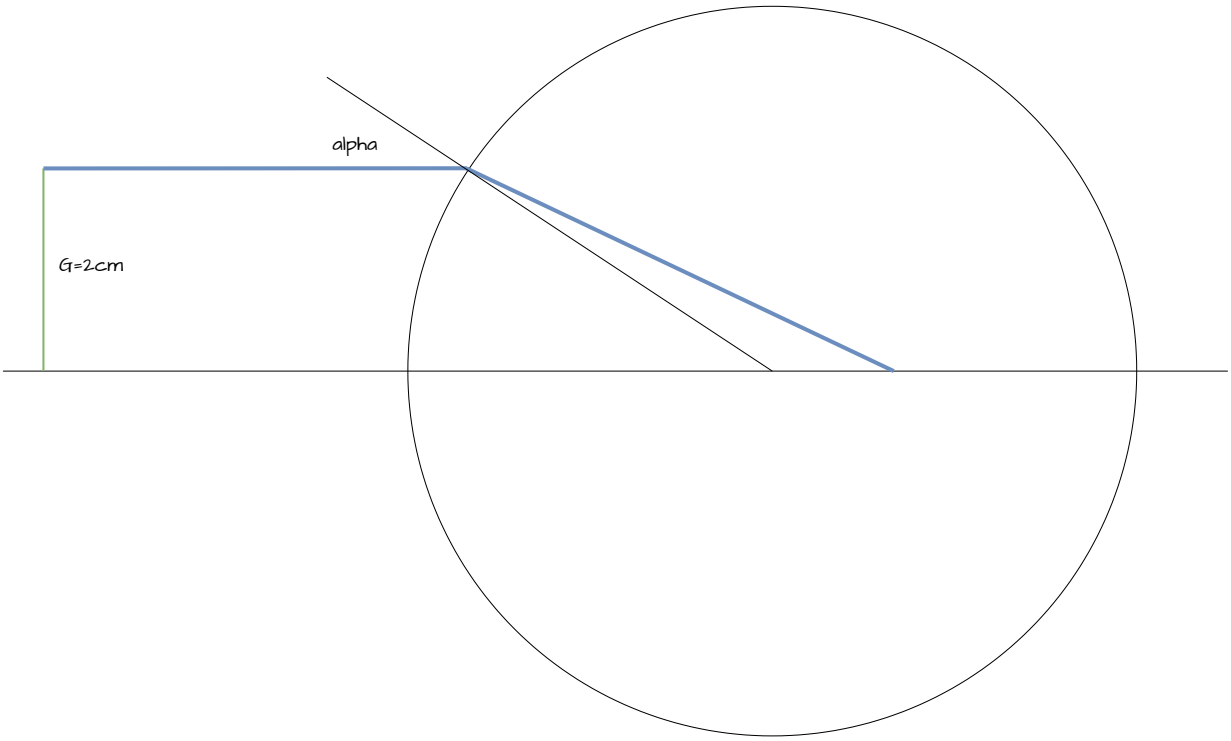

Fig. 1: Reflektierung in einem kreis

$$\frac{\sin(\alpha)}{\sin(\beta)} = \frac{n_{P_L}}{n_L}$$

$$\sin(\alpha) = \frac{G}{r} \implies \alpha = \arcsin\left(\frac{2}{3.6}\right) = 33.75^\circ$$

$$\beta = \arcsin\left(\frac{n_L}{n_{p_L}} * \sin(\alpha)\right) = \arcsin(\frac{1}{1.43} * \sin(33.75^\circ)\Big) = 21.9^\circ$$

$$\gamma = 180 - 90 - \alpha = 34.25^\circ$$
$$\delta = 180 - 90 - \gamma - \beta = 11.8^\circ$$
$$\tan(\delta) = \frac{G}{x}$$

Sinussatz Dreieck AFM

$$\frac{\sin(\beta)}{f-r} = \frac{\sin(180-\alpha)}{y} = \frac{\sin(\alpha)}{y}$$

achsnahe Strahlen => $y \approx f$

$$\frac{n_{p_L}}{n_L} = \frac{\sin(\alpha)}{\sin(\beta)} = \frac{f}{f-r} \implies f * \frac{n_{p_L}}{n_L} - r * \frac{n_{p_L}}{n_L} = f$$

$$\frac{1}{f} = \frac{1}{b} + \frac{1}{g}$$

$$f ... Brennweite$$

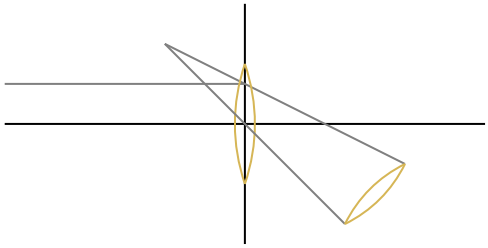

Fig. 2: drawio

x