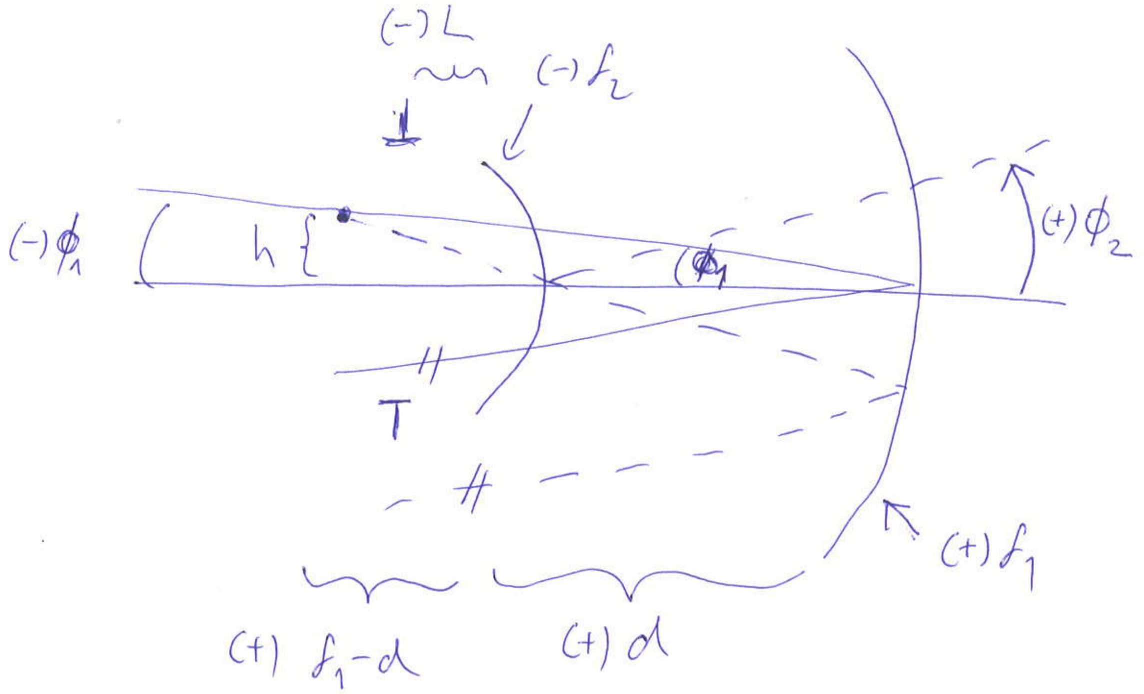
afokální teleskop

$$W = \frac{m+1}{m-1}\,\frac{x\,r^2\phi}{R^2} + \frac{x^2\phi^2}{R^4}$$

obrazový úhel

$m_1 = 0\,,\quad m_2 = \infty$



$h = -\phi_1 f_1$

$$\phi_2 = -\phi_1 \frac{f_1}{f_1 - d}$$

odraz : $W_2 \to -W_2$

$\phi_1 \to \phi_2$

$$\frac{1}{L} = \frac{1}{f_2} - \frac{1}{d} = \frac{d - f_2}{f_2 d} \Rightarrow L = \frac{f_2 d}{d - f_2}$$

$$\frac{D_2}{D_1} = \frac{f_1 - d}{f_1}\,,\quad f_2 = d - f_1$$

primární zrcadlo $(m_1 = 0)$

$$W_{c1} = -\frac{x_1 r_1^2 \phi_1}{R_1^2}$$

$$A_{c1} = -\frac{\left(\frac{D_1}{2}\right)^3}{(-2f_1)^2}\phi_1 = -\frac{1}{32}\frac{D_1^3}{f_1^2}\phi_1$$

$$W_{a1} = \frac{x_1^2 \phi_1^2}{R_1}$$

$$A_{a1} = \frac{\left(\frac{D_1}{2}\right)^2}{-2f_1} = -\frac{1}{8}\frac{D_1^2 \phi_1^2}{f_1}$$

sekundární zrcadlo $(m_2 = \infty)$

$$W_{c2} = -\frac{x_2 r_2^2 \phi_2}{R_2^2}$$

$$A_{c2} = \frac{-\left(\frac{D_2}{2}\right)^3}{(2f_2)^2}\left(-\frac{f_1}{f_1 - d}\phi_1\right) = \frac{1}{32}\frac{D_2^3}{f_2^2}\frac{f_1}{f_1 - d}\phi_1$$

$$= \frac{1}{32}\left(\frac{f_1 - d}{f_1}\right)^3 D_1^3 \frac{1}{(f_1 - d)^2}\frac{f_1}{f_1 - d}\phi_1$$

$$= \frac{1}{32}\frac{D_1^3}{f_1^2}\phi_1$$

$$W_{a2} = \left(a_{a2} - 2L\, a_{c2}\right) x_2^2 \phi_2^2$$

$$= \left[-\frac{1}{R_2} - 2L\left(-\frac{1}{R_2^2}\right)\right] x_2^2 \phi_2^2$$

$$A_{a2} = \left(\frac{D_2}{2}\right)^2 \left(\frac{f_1}{f_1 - d}\right)^2 \phi_1^2 \frac{1}{2f_2}\left[-1 + \frac{2L}{R_2}\right]$$

$$= \frac{1}{8} D_1^2 \left(\frac{\cancel{f_1 - d}}{\cancel{f_1}}\right)^2 \left(\frac{\cancel{f_1}}{\cancel{f_1 - d}}\right)^2 \phi_1^2 \frac{1}{f_2}\left[-1 + \frac{L}{f_2}\right]$$

$$= \frac{1}{8} D_1^2 \phi_1^2 \frac{1}{d - f_1}\left[-1 + \frac{\cancel{f_2}\, d}{\cancel{f_2}(d - f_2)}\right] \;(=)$$

$$d - f_2 = d - d + f_1 = f_1$$

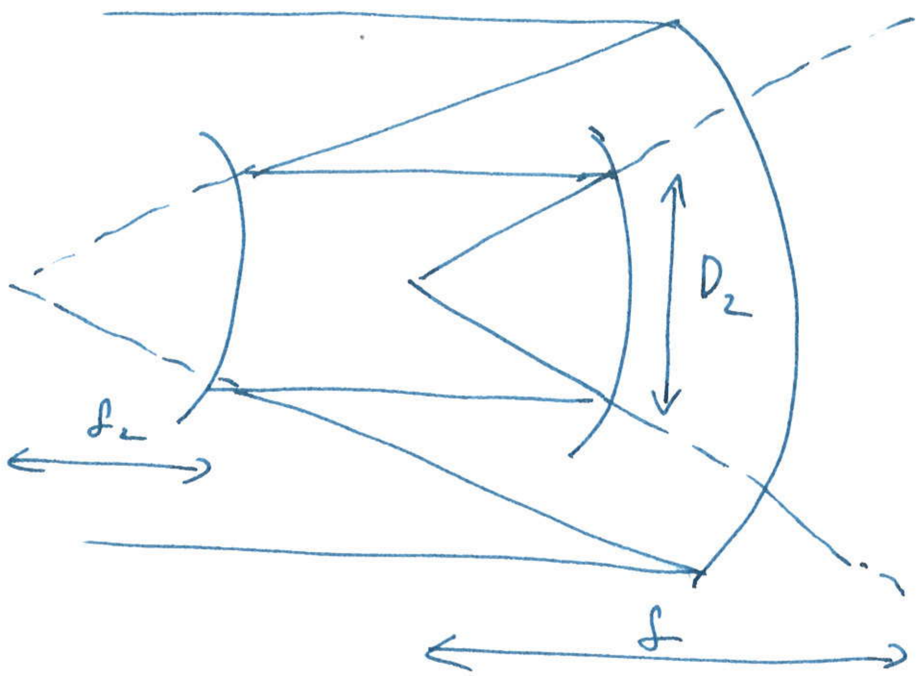
$$(=) \quad \frac{1}{8} D_1^2 \phi_1^2 \frac{1}{\cancel{d - f_1}} \frac{\cancel{d - f_1}}{f_1}$$

$$= \frac{1}{8} \frac{D_1^2 \phi_1^2}{f_1}$$

$$A_{c1} + A_{c2} = 0$$

$$A_{a1} + A_{a2} = 0$$

Paul - Baker



$$\frac{D_2}{D_1} = \frac{f_2}{f_1}$$

$$\frac{D_2}{D_1} = \frac{f_3}{f}$$

$$f = f_1 \frac{f_3}{f_2}$$

$$\boxed{f = f_1 \frac{R_3}{R_2}}$$

odvození K_2 pro $R_2 \neq R_3$

bez SA : $K_1 = -1$, $K_2 = -1$, $K_3 = -1$

systém : $K_1 = -1$, K_2, $K_3 = 0$

SA : 0, $\frac{(1+K_2)}{R_2^3}$, $\frac{1}{R_3^3}$

$$\frac{(1+K_2)}{R_2^3} = \frac{1}{R_3^3}$$

$$K_2 = \left(\frac{R_2}{R_3}\right)^3 - 1$$

např. $R_2 = R_3 \Rightarrow K_2 = 0$

$R_2 = \frac{R_3}{2} \Rightarrow K_2 = -\frac{7}{8} = -0{,}875$

OSLO

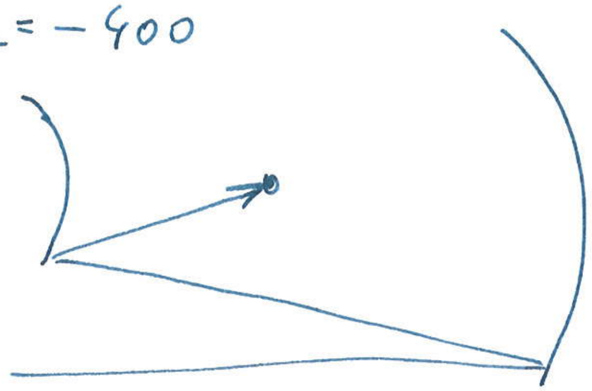
① **2 zrcadla** – $f = 1000$

$R_2 = -400$

$R_1 = -1000$

$D_1 = 200$

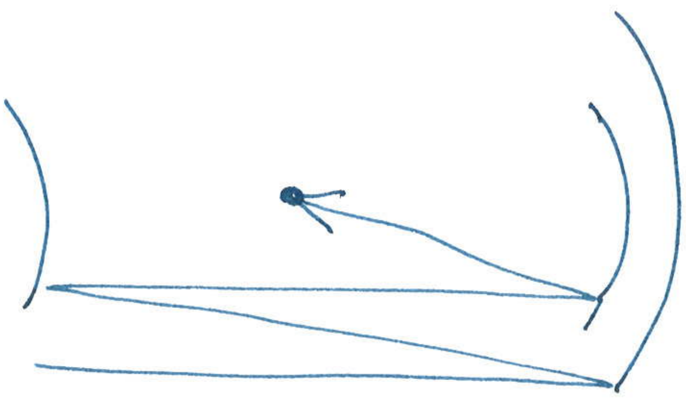
$K_1 = -1$



$d_1 = -400$

K_2 ... solve (-9)

② **3 zrcadla** – $f = 1000$



$R_1 = -1000$, $d_1 = -400$, $K_1 = -1$

$R_2 = -200$, $d_2 = 400$, K_2 = solve $(-0{,}875)$

$R_3 = -400$, $d_3 = -200$, $K_3 = 0$

$R_{IMG} = 330$ $\left(+ \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} = \frac{1}{R} \right)$