

ACROMATIC DOUBLET

Thin lens $\phi_a \phi_b$

$\phi_a + \phi_b = \phi$

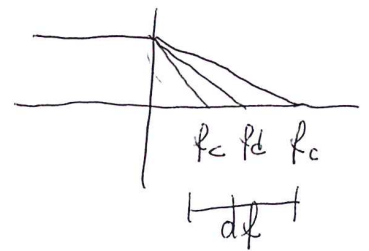
LENTE SINGOLA:

$$d\phi = (n-1)(c_1 - c_2) \rightarrow d\phi = (c_1 - c_2) dm = (c_1 - c_2)(m_F - m_C)$$

$$d\phi = (c_1 - c_2)(m_F - m_C) \cdot \frac{m_d - 1}{m_d - 1} \Rightarrow d\phi = (c_1 - c_2)(m_d - m_c) \frac{m_F - m_C}{m_d - 1}$$

$$\boxed{d\phi = \frac{\phi_d}{V_d}} \Leftrightarrow$$

riscriviamo in termini di f



$$\left\{ \begin{aligned} \frac{d\phi}{\phi_d} &= \frac{1}{V_d} \quad (16.6) \\ \phi_d &= V_d \end{aligned} \right.$$

$$\left\{ \begin{aligned} \phi &= \frac{1}{f} \Rightarrow d\phi = -\frac{1}{f^2} df \Rightarrow \frac{d\phi}{\phi} = -\frac{df}{f} \end{aligned} \right.$$

da cui $\frac{df}{df} = V_d$ il num. di Abbe \bar{v} il rapporto delle focali per il primary axial color

DOPIETTO

$$\phi = \phi_a + \phi_b \Rightarrow d\phi = d\phi_a + d\phi_b = \frac{\phi_a}{V_a} + \frac{\phi_b}{V_b} = 0$$



$$\left\{ \begin{aligned} \phi_1 + \phi_2 &= \phi \\ \frac{\phi_1}{V_1} + \frac{\phi_2}{V_2} &= 0 \end{aligned} \right. \quad \text{achromat conditions}$$

$$\left\{ \begin{aligned} \phi_1 + \phi_2 + \phi_3 &= \phi \\ \frac{\phi_1}{V_1} + \frac{\phi_2}{V_2} + \frac{\phi_3}{V_3} &= 0 \\ \frac{P_1}{V_1} \phi_1 + \frac{P_2}{V_2} \phi_2 + \frac{P_3}{V_3} \phi_3 &= 0 \end{aligned} \right. \quad \text{apochromatic conditions}$$

$$\left\{ \varphi = \varphi_a + \varphi_b \Rightarrow \varphi_b = \varphi - \varphi_a \right.$$

$$\left\{ \frac{\varphi_a}{\nu_a} + \frac{\varphi_b}{\nu_b} = 0 \Rightarrow \varphi_b = -\frac{\nu_b}{\nu_a} \varphi_a \right.$$

$$\text{da cui } \varphi - \varphi_a = -\frac{\nu_b}{\nu_a} \varphi_a \Rightarrow \left(1 - \frac{\nu_b}{\nu_a}\right) \varphi_a = \varphi \Rightarrow \varphi_a = \frac{\nu_a}{\nu_a - \nu_b} \cdot \varphi$$

$$\text{e allo stesso modo } \varphi_b = \frac{\nu_b}{-(\nu_a - \nu_b)} \varphi$$

$$\left\{ \begin{array}{l} \varphi_a = \frac{\nu_a}{\Delta\nu} \varphi \\ \varphi_b = -\frac{\nu_b}{\Delta\nu} \varphi \end{array} \right. \quad \text{calcolato aus Schublet}$$

$$f = 400 \text{ mm } (\varphi = 0,0025)$$

$$a = \text{BK7 } \nu_a = 64,17$$

$$b = \text{SF2 } \nu_b = 33,85$$

$$\Rightarrow \varphi_a = \frac{64,17}{64,17 - 33,85} \cdot 0,0025 = 0,005291$$

$$\varphi_b = \frac{33,85}{64,17 - 33,85} \cdot 0,0025 = -0,002791$$