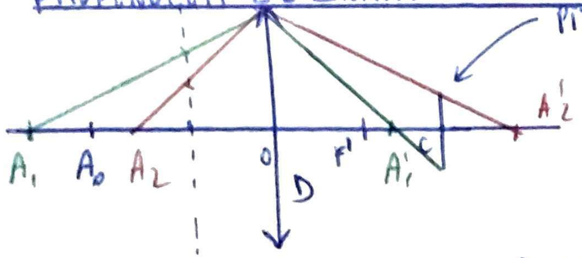
PROFONDEUR DE CHAMP – REGLAGE QUELCONQUE



* Soit A_0 le pt tel que $A_0 \xrightarrow{\text{lentille}} C$

On appelle $L = \overline{A_0O}$ (distance de visée)

On a $-\dfrac{1}{\overline{OA_0}} + \dfrac{1}{\overline{OC}} = \dfrac{1}{f'}$ ie $\dfrac{1}{L} + \dfrac{1}{\overline{OC}} = \dfrac{1}{f'}$

d'où $\dfrac{1}{\overline{OC}} = \dfrac{1}{f'} - \dfrac{1}{L} = \dfrac{L-f'}{f'L} \Rightarrow \boxed{\overline{OC} = \dfrac{f'L}{L-f'}}$

* <u>Thalès</u>

(1) $\dfrac{D^{>0}}{\overline{OA'_1}_{>0}} = \dfrac{\varepsilon^{>0}}{\overline{A'_1C}} = \dfrac{\varepsilon}{\overline{A'_1O} + \overline{OC}} = \dfrac{\varepsilon}{-\overline{OA'_1} + \frac{f'L}{L-f'}}$

D'où $D\left(-\overline{OA'_1} + \dfrac{f'L}{L-f'}\right) = \varepsilon\, \overline{OA'_1}$

$\Rightarrow \boxed{\overline{OA'_1} = \dfrac{f'LD}{(L-f')(\varepsilon+D)}}$

(2) $\dfrac{D^{>0}}{\overline{OA'_2}_{>0}} = \dfrac{\varepsilon^{>0}}{\overline{CA'_2}} = \dfrac{\varepsilon}{\overline{CO} + \overline{OA'_2}} = \dfrac{\varepsilon}{-\overline{OC} + \overline{OA'_2}}$

$\Rightarrow \boxed{\overline{OA'_2} = \dfrac{-f'LD}{(L-f')(\varepsilon - D)}}$

* <u>Descartes</u>

(1) $A_1 \longrightarrow A'_1 \quad : \quad -\dfrac{1}{\overline{OA_1}} + \dfrac{1}{\overline{OA'_1}} = \dfrac{1}{f'}$

$\Rightarrow -\dfrac{1}{\overline{OA_1}} + \dfrac{(L-f')}{f'LD}(\varepsilon + D) = \dfrac{1}{f'}$

$\Rightarrow \dfrac{1}{\overline{OA_1}} = \dfrac{1}{f'}\left[\dfrac{(L-f')(\varepsilon+D)}{LD} - 1\right] = \dfrac{(L-f')\varepsilon - f'D}{f'LD}$

$\Rightarrow \overline{OA_1} = \dfrac{f'LD}{(L-f')\varepsilon - f'D} = \dfrac{L}{-1 + (L-f')\frac{\varepsilon}{f'D}} = \dfrac{-L}{1 - (L-f')\frac{\varepsilon}{f'D}}$

Dével. limité $\left(\dfrac{1}{1+x} \simeq 1 - x\right)$ Petit par rapport à 1

$\Rightarrow \boxed{\overline{OA_1} \simeq -L\left(1 + (L-f')\dfrac{\varepsilon}{f'D}\right)}$

<u>De même</u> $\boxed{\overline{OA_2} \simeq -L\left(1 - \dfrac{(L+f')\varepsilon}{f'D}\right)}$ (2) Descartes $A_2 \to A'_2$

<u>Profondeur de champ</u> $\overline{A_1A_2} = \overline{OA_2} - \overline{OA_1}$

$= \dfrac{L}{f'D}\varepsilon\left(L + f' + (L - f')\right)$

Soit $\boxed{\overline{A_1A_2} = \dfrac{2L^2\varepsilon}{f'D}}$

Si $D \nearrow$ $\underline{\overline{A_1A_2} \searrow}$