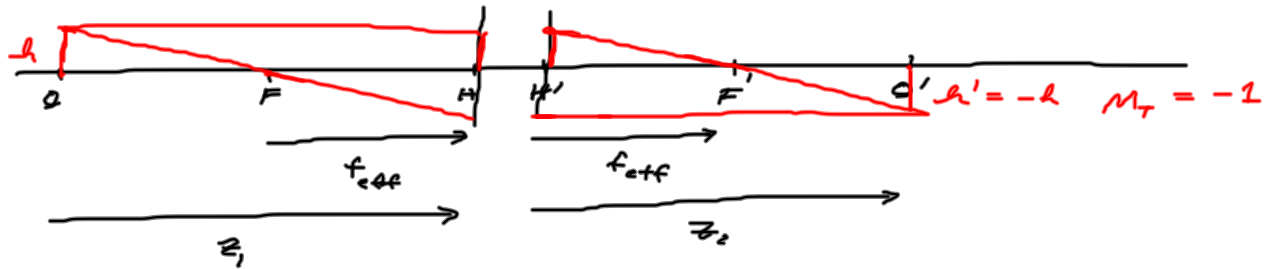


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②



$$z_1 = z_2 = 2 f_{\text{eff}} \quad \frac{1}{z_1} + \frac{1}{z_2} = \frac{1}{f_{\text{eff}}}$$

$$M_T = -\frac{z_2}{z_1} = -1$$

STOP - ELEMENT THAT CONSTRAINS CONE OF RAYS  $\Rightarrow$  BRIGHTNESS

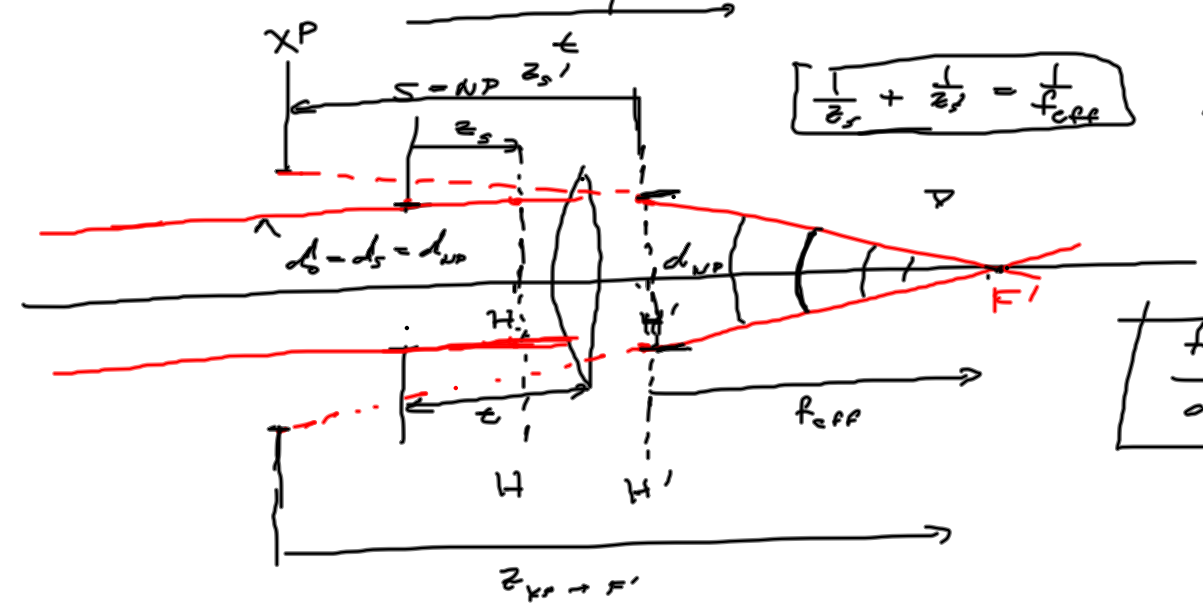
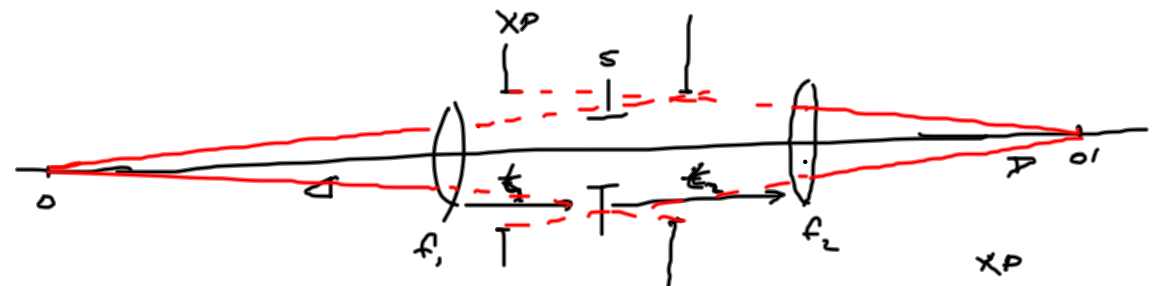
NP - IMAGE OF STOP IN OBJECT SPACE  $\leftarrow$

XP - " " " " IMAGE "

$$f/\# = \frac{f}{d_0} \rightarrow \frac{f_{\text{eff}}}{d_{\text{NP}}}$$

$$D_0 \approx 2.44 \lambda \frac{f/\#}{\text{DEPTH OF FIELD + RESOLUTION}}$$

2/27 - ②

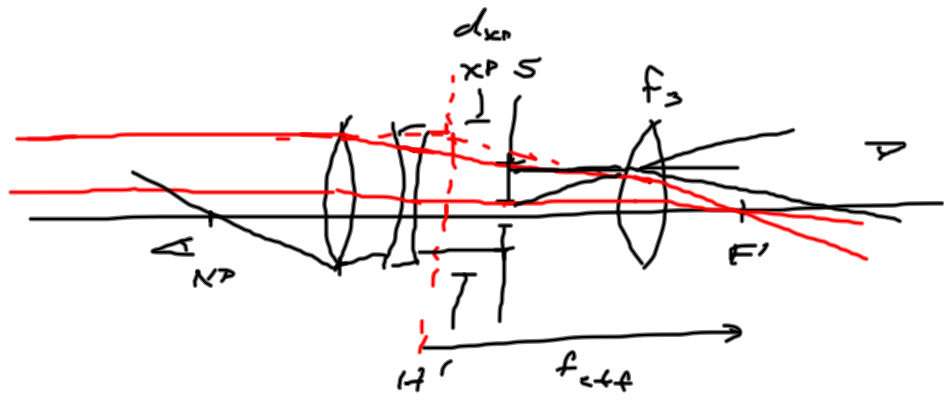


$$\frac{1}{z_s} + \frac{1}{z_{s'}} = \frac{1}{f_{eff}}$$

$$M_T = -\frac{z_{s'}}{z_s}$$

$$\frac{f_{eff}}{d_{wp}} = f/H$$

2/17 - ③

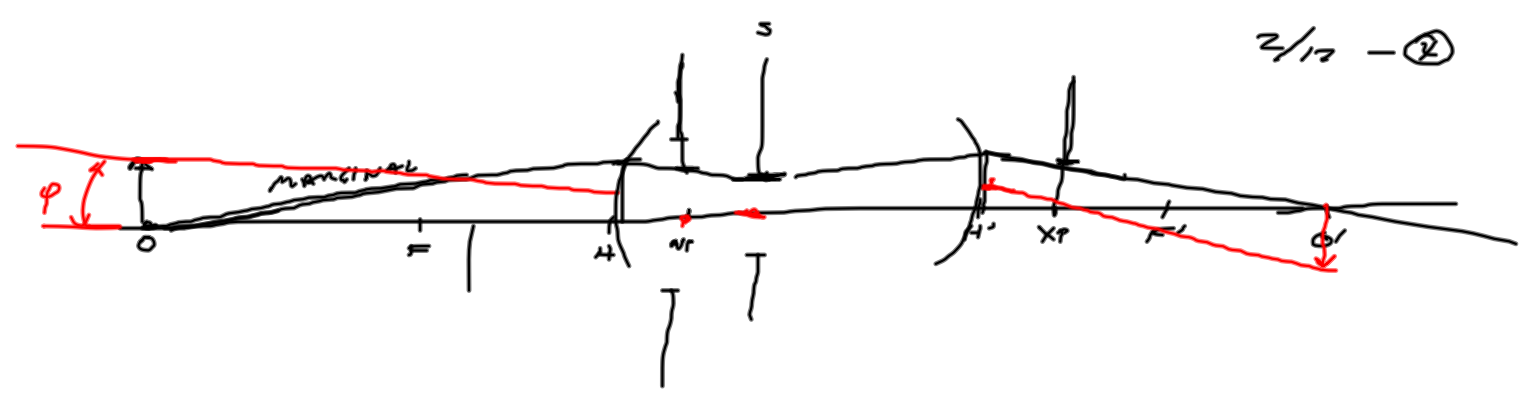


$$\frac{1}{z_s} + \frac{1}{z_s'} = \frac{1}{f_3}$$

---


$$\frac{f_{\text{eff}}}{d_{\text{ker}}} = f/\# \Rightarrow \begin{aligned} D_o &\approx 2.44 \lambda_0 f/\# \\ D_o f &\propto (f/\#)^2 \end{aligned}$$

2/12 - ②



MARGINAL RAY - FROM CENTER OF OBJECT - EDGE OF STOP  
 (IMAGE) NP, XP

CHIEF RAY (PRINCIPAL) - EDGE OF OBJECT - CENTER OF STOP  
 (IMAGE) NP, XP

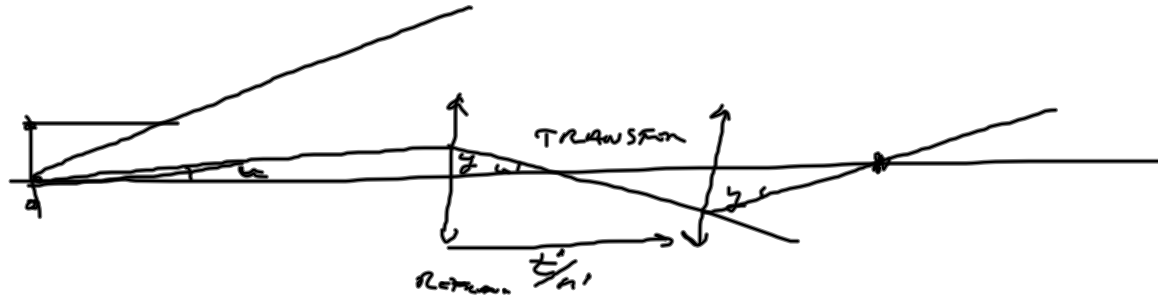
$$(M_T)_{HH'} = +1 \quad z_{OH} \Leftrightarrow z_{H'P} \Rightarrow \frac{1}{z_{OH}} + \frac{1}{z_{H'P}} = \frac{1}{f_{eff}}$$

$$z_1 = z_2 = 2f_{eff} \Rightarrow M_T = -1$$

$$M_T = -\frac{z_{H'P}}{z_{OH}}$$

2/17 ③

PARAXIAL RAYS  $\rightarrow$  ANGLES  $\cong 0$   
 $\sin \theta \cong \tan \theta \cong \theta$



MATRIX MULTIPLICATION

$$\begin{bmatrix} y \\ nu \end{bmatrix}$$

$$\begin{bmatrix} y \\ nu \end{bmatrix}$$

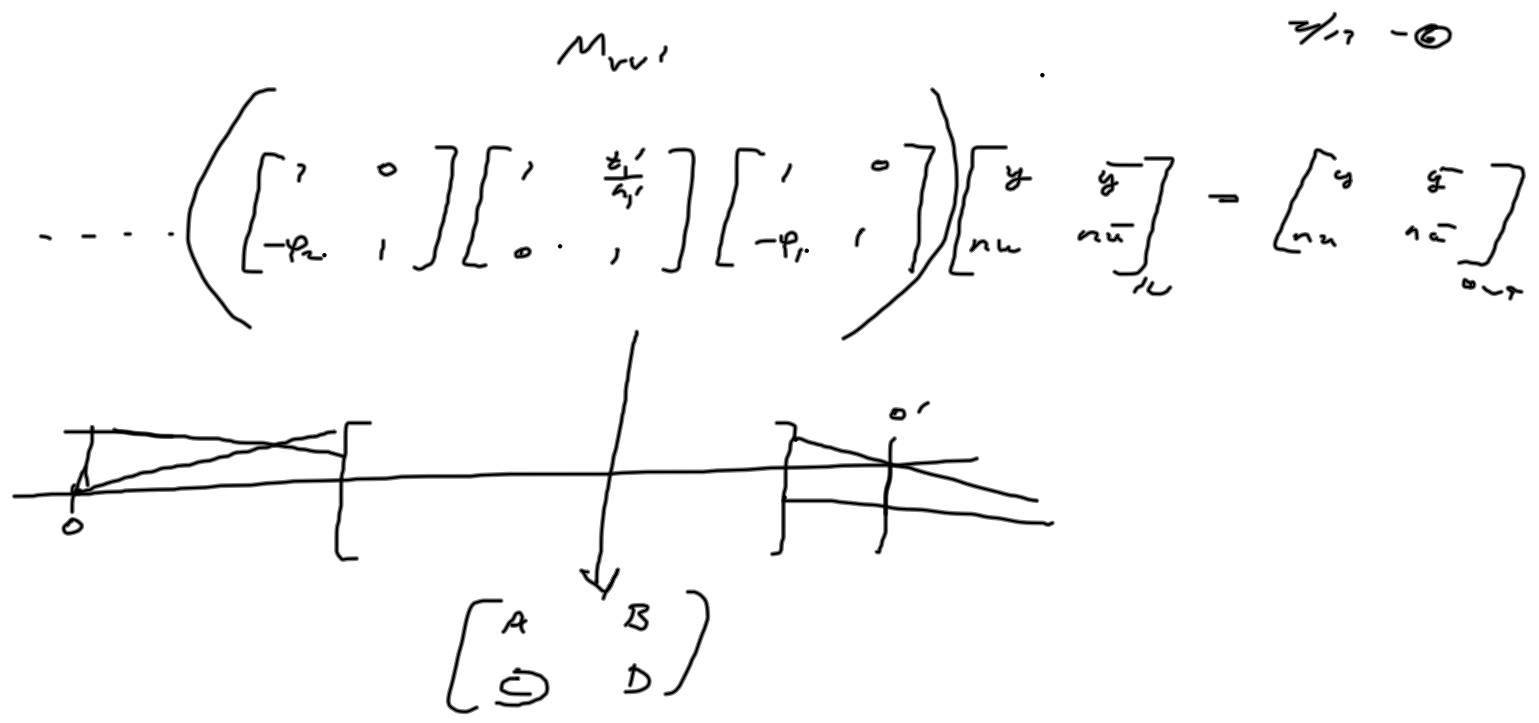
$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} y \\ nu \end{bmatrix} - \text{ray}$$

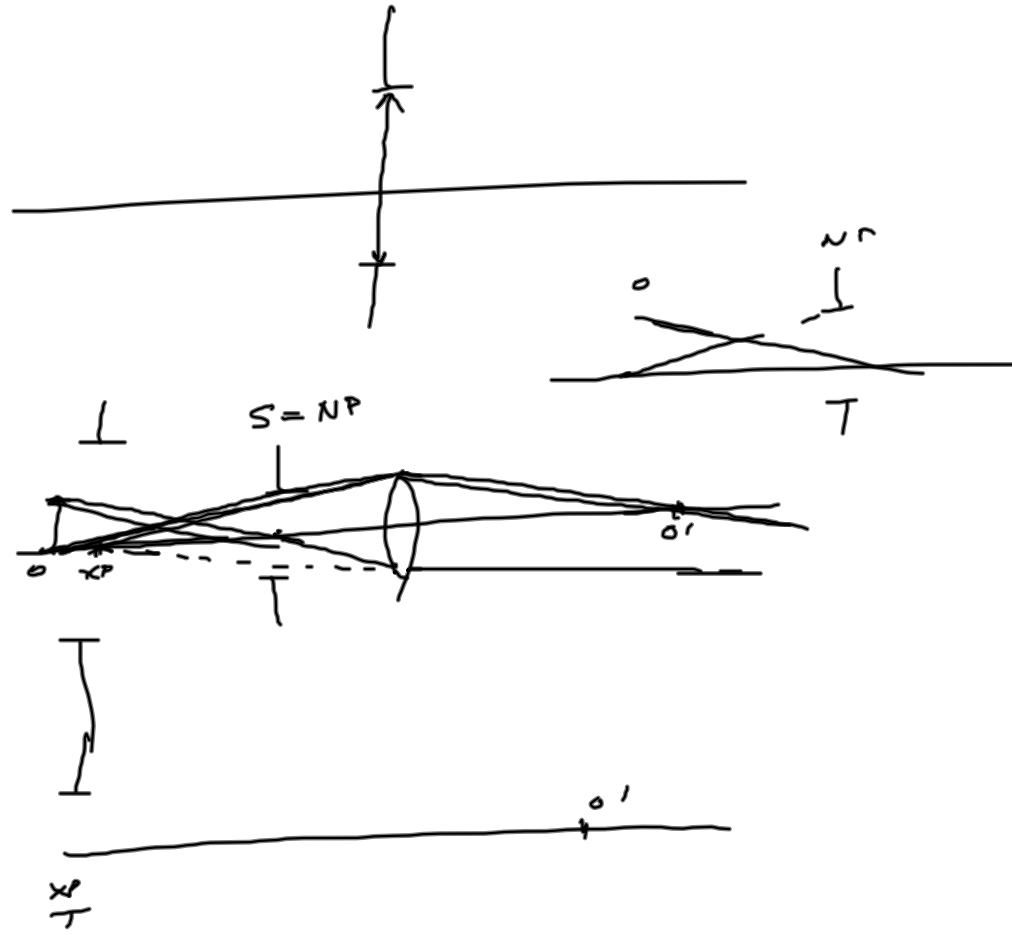
$$\begin{bmatrix} 1 & \\ 0 & \end{bmatrix}$$

$$\begin{bmatrix} 0 \\ nu \end{bmatrix}$$

$$\begin{bmatrix} 0 \\ 1 \end{bmatrix}$$



2/n - ①



DIFFRACTION MONOCHROMATIC

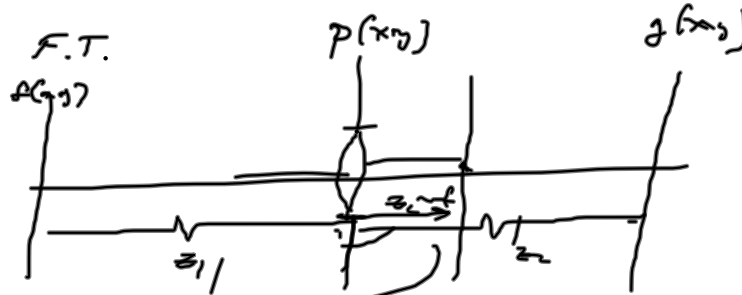
FRAUNHOFER

LSI  $\Rightarrow h, H, \text{ QUADRATURE}$

FRANZISFON

LSV  $\Rightarrow$  F.T.

IMAGING



$$g(xy) = f(xy) * P\left[\frac{x}{\lambda z_2}, \frac{y}{\lambda z_2}\right]$$

$$g(xy) \propto f\left[-\frac{x}{\lambda z_1}, -\frac{y}{\lambda z_1}\right] * P\left[\frac{x}{\lambda z_2}, \frac{y}{\lambda z_2}\right]$$

$$P\left[\frac{x}{\lambda z_2}, \frac{y}{\lambda z_2}\right] = h(xy, z_0, p, z_2, \lambda_0)$$

$$P[-\lambda_0 z_1, -\lambda_0 z_1] \propto |f(xy)| \dots$$

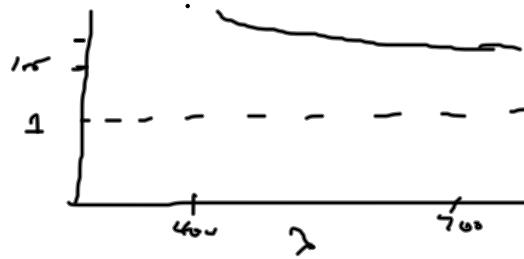
$$\frac{1}{z_1} + \frac{1}{z_2} = \frac{1}{f}$$

POLYCHROMATIC  $\Rightarrow$  ~~LSI~~ INCOHERENT  $\Rightarrow$  NO FURSE REMAINST

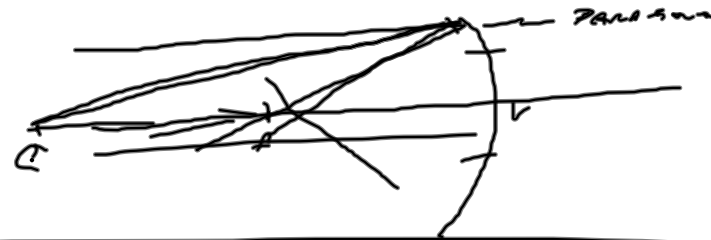
$$h[xy] \propto |P|^2 \geq 0 \quad P[-\lambda_0 z_1, -\lambda_0 z_1] * P[\dots]$$

INDEX OF REFRACTION  $\rightarrow$  DISPERSION

2/17 (9)



$f_{\text{red}} > f_{\text{blue}}$



FRESNEL EQUATIONS

$v_{TE}$   $v_{TM}$

POLARIZED LIGHT - LINEAR ELLIPTICAL, CIRCULAR

INTERFERENCE  $D_oA, D_oW$  - ~~AND~~ MICHELSON  $D_oA$

YOUNG'S

$D_oW$

RAY OPTICS