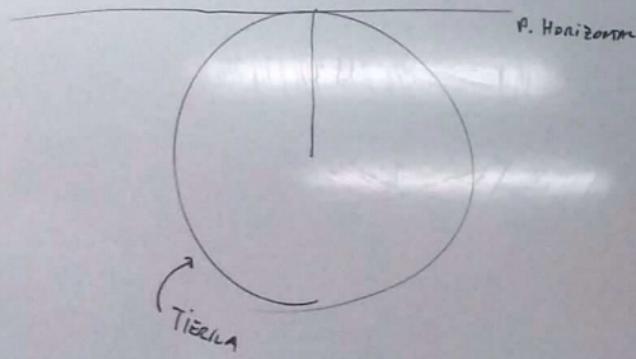


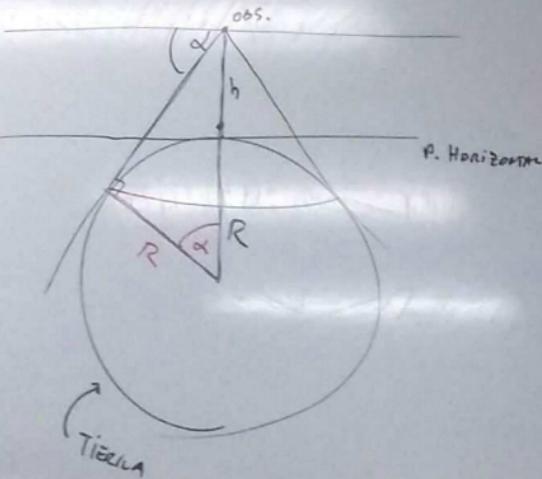
DEPRESIÓN DEL HORIZONTE



DEPRESIÓN DEL HORIZONTE

α = DEPRESIÓN

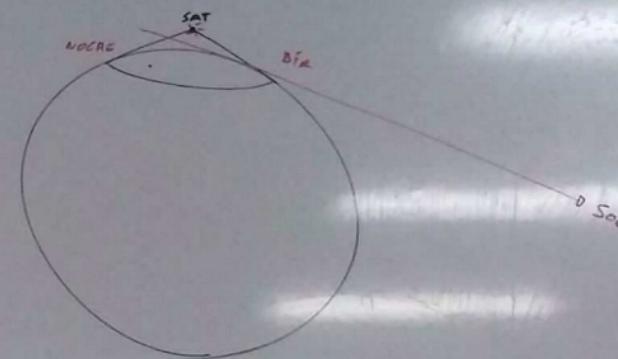
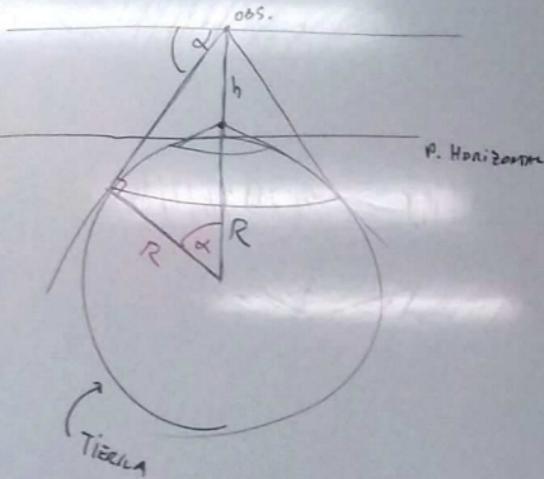
$$\cos \alpha = \frac{R}{R+h} = \frac{1}{1+b/R}$$



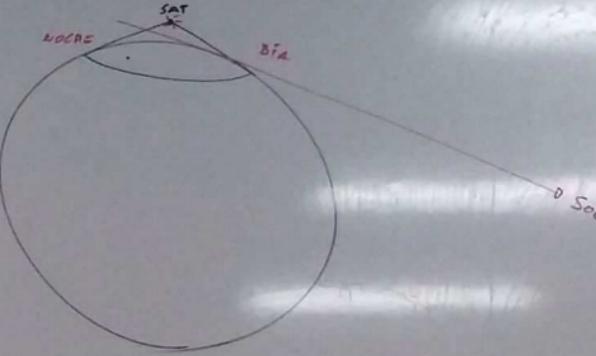
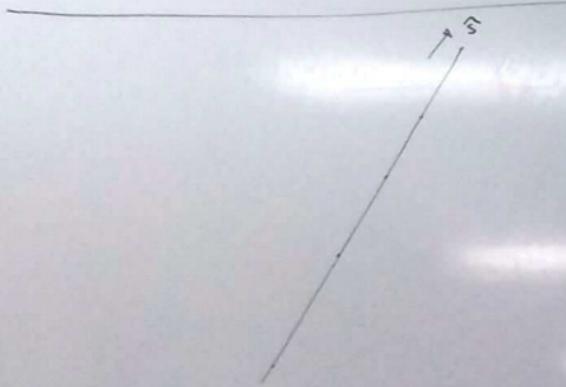
DEPRESIÓN DEL HORIZONTE

α = DEPRESIÓN

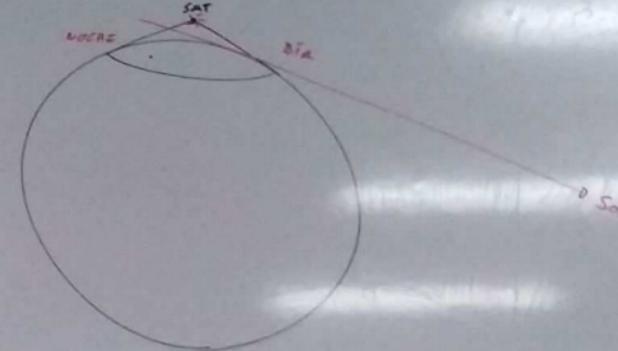
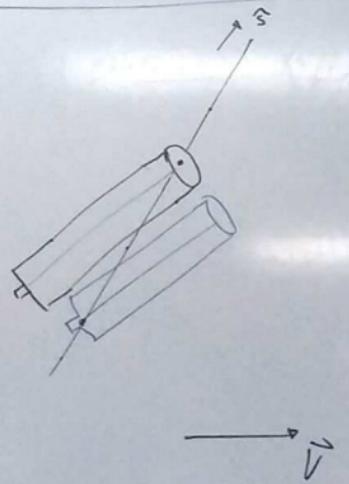
$$\cos \alpha = \frac{R}{R+h} = \frac{1}{1+h/R}$$



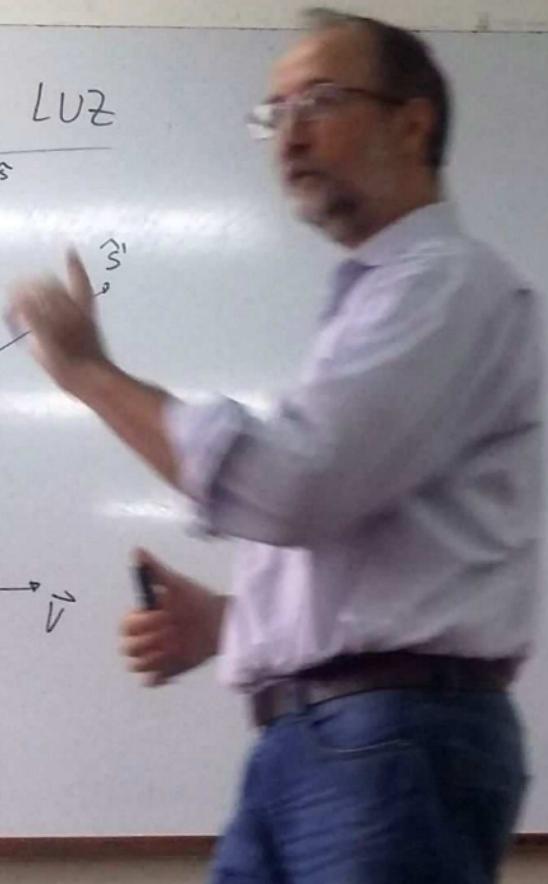
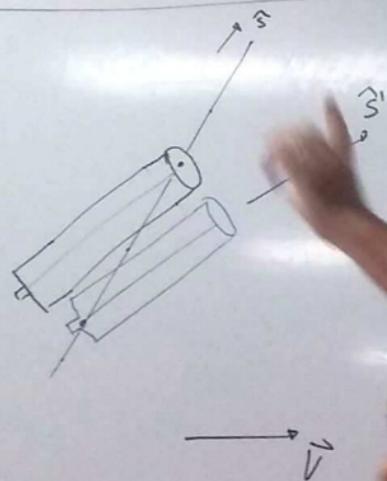
ABERRACIÓN DE LA LUZ



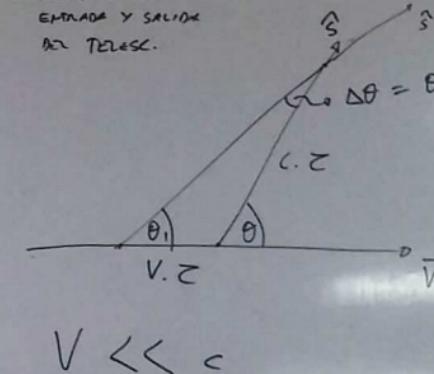
ABERRACIÓN DE LA LUZ



ABERRACIÓN DE LA LUZ



c : TIEMPO ENTRE
ENTRADA Y SALIDA
DEL TELES.

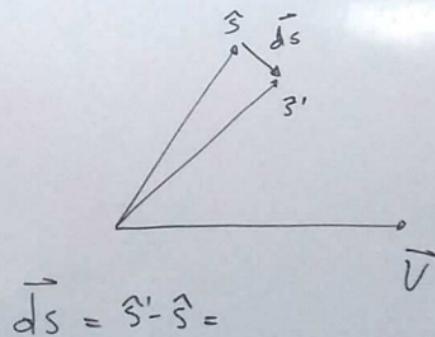


$$\Rightarrow \frac{\Delta m \Delta \theta}{V.z} = \frac{\Delta m \theta_1}{c.z}$$

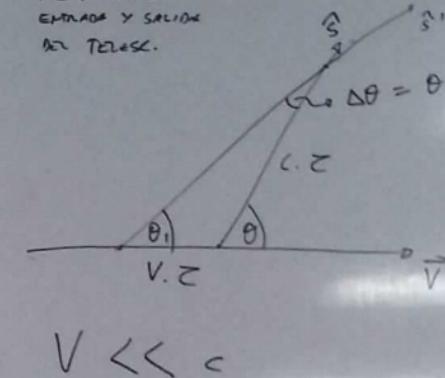
$$\Rightarrow \Delta m \Delta \theta = \left(\frac{V}{c} \right) \cdot \Delta m \theta_1$$

$$\Delta \theta (\text{RAD}) \approx \frac{V}{c} \cdot \Delta m \theta_1 \simeq \frac{V}{c} \cdot \Delta m \theta$$

ABERRACIÓN DE LA LUZ



c : Tiempo entre
ENTRADA Y SALIDA
DEL TELES.

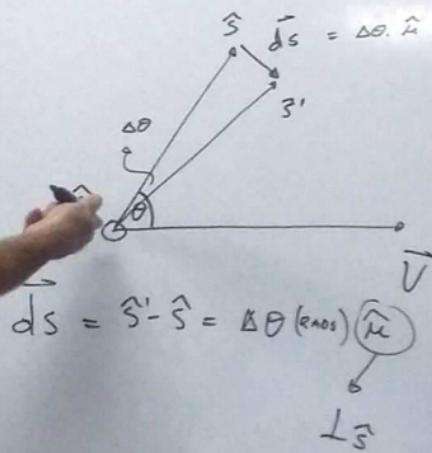


$$\Rightarrow \frac{\Delta\theta}{Vc} = \frac{\theta_1}{cz}$$

$$\Rightarrow \Delta\theta = \left(\frac{V}{c}\right) \cdot \theta_1$$

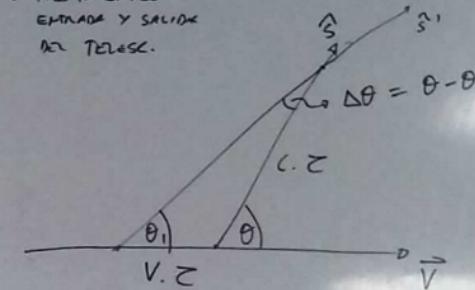
$$\Delta\theta (\text{RAD}) \approx \frac{V}{c} \cdot \theta_1 \approx \frac{V}{c} \cdot m\theta$$

ABERRACIÓN DE LA LUZ



$$\hat{n} = \frac{\vec{V} \wedge \hat{s}}{V \cdot \sin \theta}$$

c : TIEMPO ENTRE
ENTRADA Y SALIDA
DEL TELESCOPIO.



$$V \ll c$$

$$\Rightarrow \frac{\Delta n \Delta\theta}{V.c} = \frac{\Delta n \theta_1}{c.c}$$

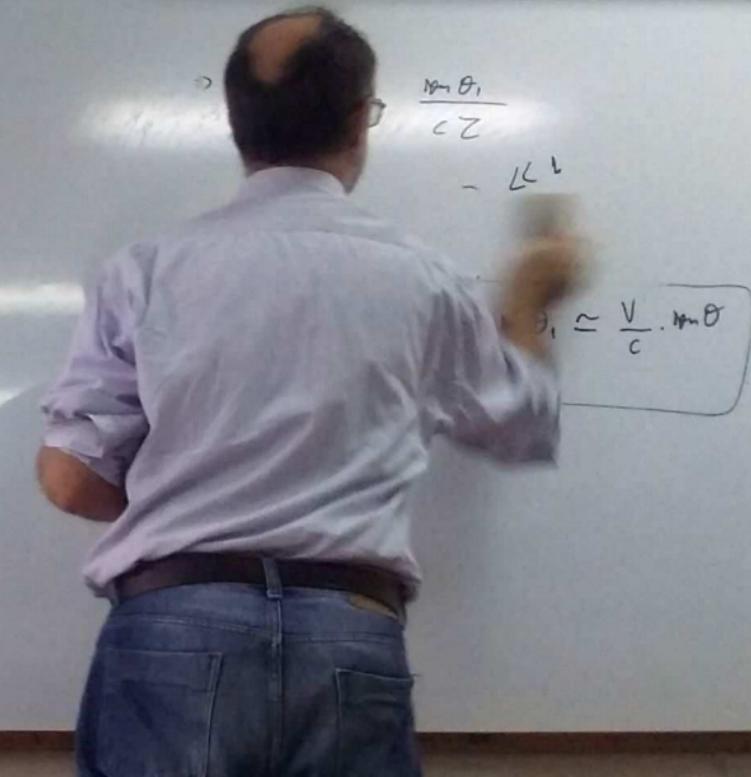
$$\Rightarrow \Delta n \Delta\theta = \left(\frac{V}{c} \right) \Delta n \theta_1$$

$$\boxed{\Delta\theta(\text{RAD}) \approx \frac{V}{c} \cdot \Delta n \theta_1 \approx \frac{V}{c} \cdot \Delta n \theta}$$

ABERRACIÓN DE LA LUZ

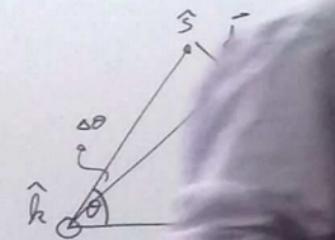
Diagram illustrating the aberration of light. A source S' emits light rays. One ray passes directly along the line of sight \hat{h} to an observer at S . Another ray is deflected by an angle $\Delta\theta$ due to the motion of the observer, reaching the observer at S as \hat{s} . The displacement vector is $\vec{ds} = \hat{s}' - \hat{s} = \Delta\theta \text{ (radio) } (\hat{\mu})$, where $\hat{\mu}$ is the unit vector in the direction of motion.

$$\vec{ds} = \hat{s}' - \hat{s} = \Delta\theta \text{ (radio) } (\hat{\mu}) = \frac{V}{c} \cdot \Delta\theta \cdot \hat{s} \wedge \left(\frac{\vec{V} \wedge \hat{s}}{V \text{ radio}} \right) = \frac{1}{c} \cdot \hat{s} \wedge (\vec{V} \wedge \hat{s})$$



ABERRACIÓN

LUZ



$$\vec{ds} = \hat{s}' - \hat{s} =$$

$$\hat{s} \wedge \left(\frac{\vec{v} \wedge \hat{s}}{c} \right) = \frac{1}{c} \cdot \hat{s} \wedge (\vec{v} \wedge \hat{s})$$

$$\vec{ds} = \frac{1}{c} \cdot \left[(\hat{s} \cdot \hat{s}) \cdot \vec{v} - (\hat{s} \cdot \vec{v}) \cdot \hat{s} \right] = \frac{1}{c} \left[\vec{v} - (\hat{s} \cdot \vec{v}) \cdot \hat{s} \right]$$

ABERRACIÓN DE LA LUZ

$$\vec{ds} = \hat{s}' - \hat{s} = \Delta\theta (\text{rads}) \hat{v} = \frac{v}{c} \cdot \Delta\theta \cdot \hat{s} \wedge \left(\hat{v} \wedge \hat{s} \right) = \frac{1}{c} \cdot \hat{s} \wedge \left(\hat{v} \wedge \hat{s} \right)$$

$\hat{h} = \frac{\hat{v} \wedge \hat{s}}{v \cdot \tan\theta}$

$\hat{h} = \hat{s}' \wedge \hat{h}$

$$\vec{ds} = \frac{1}{c} \cdot \left[(\hat{s} \cdot \hat{s}) \cdot \hat{v} - (\hat{s} \cdot \hat{v}) \cdot \hat{s} \right] = \frac{1}{c} \left[\hat{v} - (\hat{s} \cdot \hat{v}) \cdot \hat{s} \right]$$

M. VEL. OBSE.

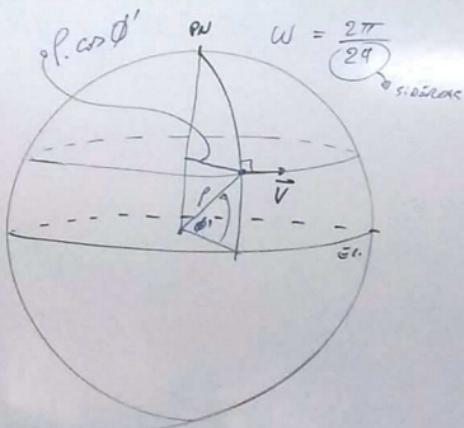
M. FOCAL

$$\frac{\vec{v}}{c} \quad \vec{ds}?$$

$$\vec{s} \quad \vec{v}$$

ABERRACIÓN DIURNA



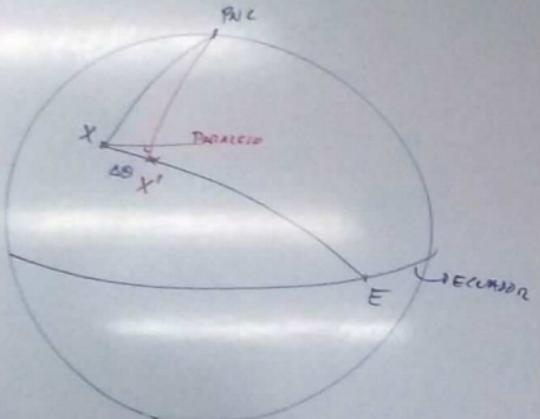
ABERRACIÓN DIURNA

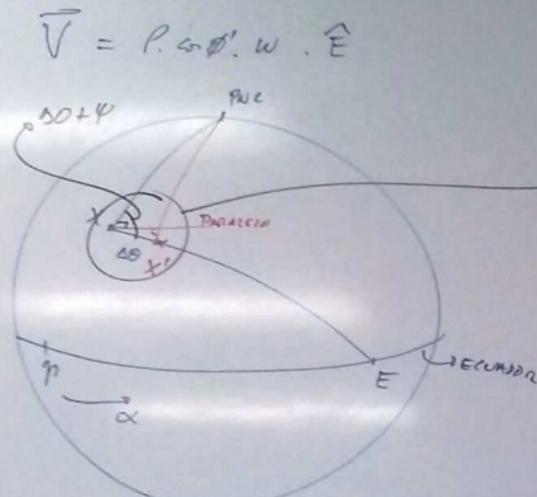
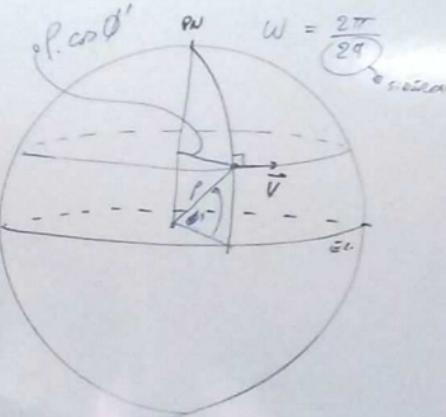
$$\vec{V} = P \cos \phi' \cdot w \cdot \hat{E}$$

ABERRACION DIURNA

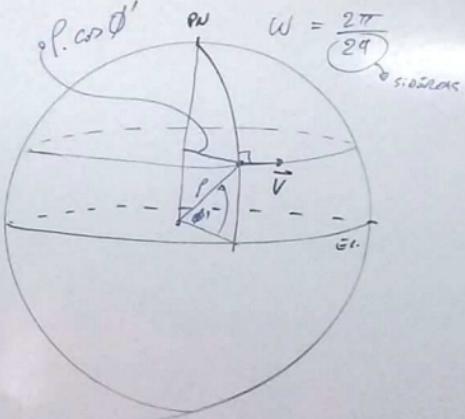


$$\vec{V} = P \cdot \cos \theta' \cdot w \cdot \hat{E}$$

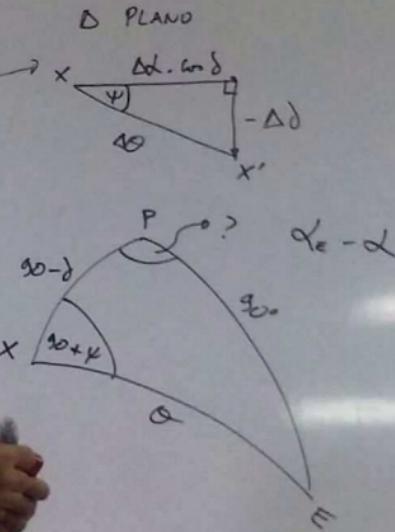
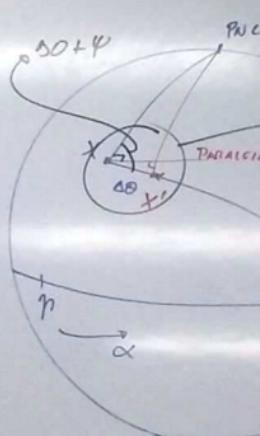


ABERRACIÓN DIURNA

$$\Delta \theta = \frac{v}{c} \cdot \cos \theta \cdot \widehat{XE}$$

ABERRACIÓN DIURNA

$$\vec{V} = P \cos \phi' \cdot w \cdot \hat{E}$$

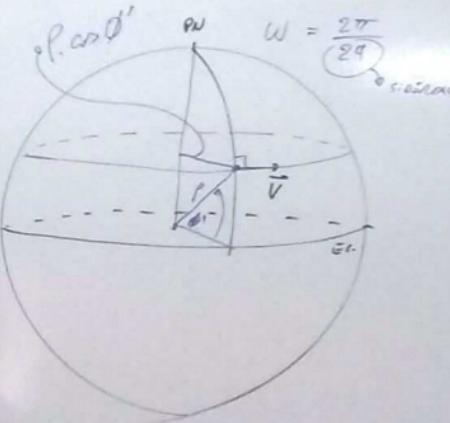


$$TSL = H + \Delta = H_e + \Delta_e$$

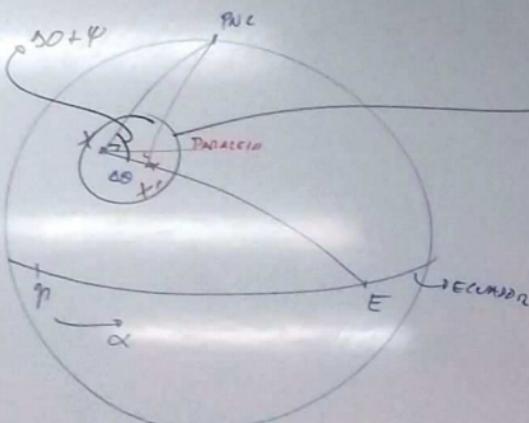
$$\Delta_e - \Delta = H - H_e$$

$$\Delta \theta = \frac{v}{c} \cdot \sin \theta$$

ABERRACIÓN DIURNA

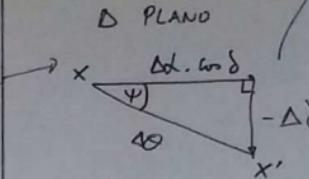


$$\vec{V} = P \cdot \cos \theta' \cdot w \cdot \hat{E}$$



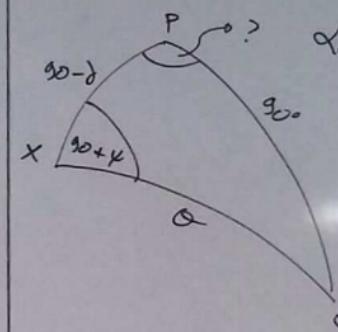
$$\Delta d_{\text{abd}} = \Delta \theta \cdot \cos \psi \Rightarrow \Delta d_{\text{abd}} = \frac{v}{c} \cdot H \cdot \theta$$

$$-\Delta d = \Delta \theta \cdot \sin \psi$$



$$TSL = H + \alpha = H_E + \alpha_E$$

$$\alpha_E - \alpha = H + 90^\circ$$



$$\Delta d_{\text{abd}} = \frac{v}{c} \cdot H \cdot \theta$$

$$\Delta d = \Delta \theta \cdot \sin \psi$$

$$H + \alpha = H_E + \alpha_E$$

$$\alpha_E - \alpha = H - H_E$$

$$H + 90^\circ$$

$$\alpha_E - \alpha =$$

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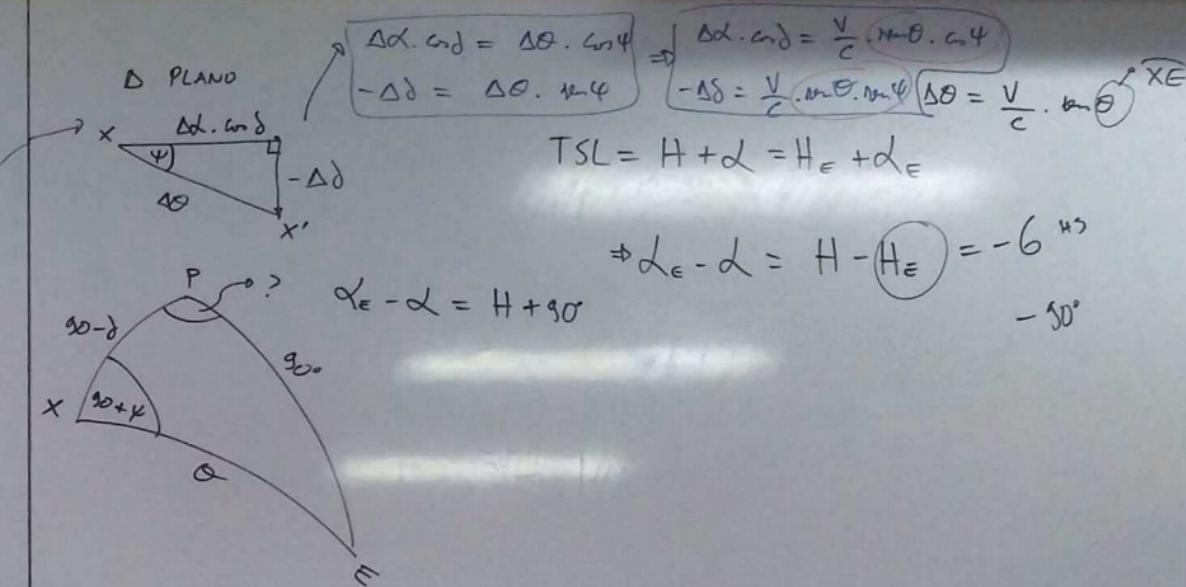
ABERRACIÓN DIURNA

$$\frac{\cos(\alpha_0 - \delta)}{\sin 90^\circ} = 1$$

$$\bar{V} = P \cdot \cos \theta' \cdot w \cdot \hat{E}$$

$$\Rightarrow \cos \theta \cdot \cos \delta = \cos H$$

$$= \frac{V}{\cos \delta} \cdot \cos H$$



ABERRACIÓN DIURNA

$$\vec{V} = P \cdot \cos \phi' \cdot w \cdot \hat{E}$$

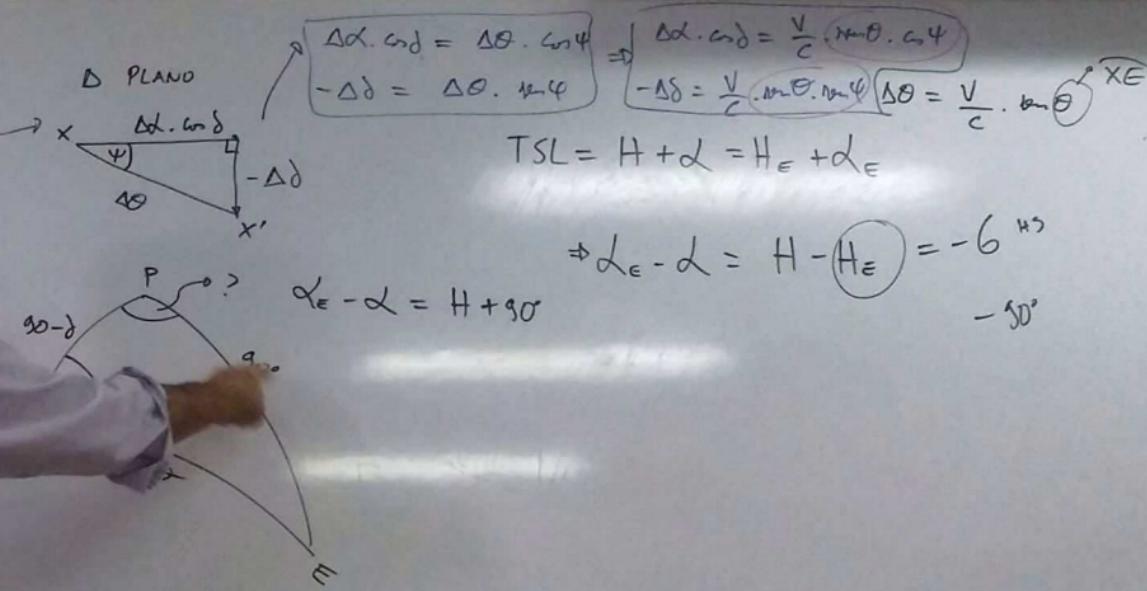
$$\frac{\cos(\phi_0 - \psi)}{\sin \phi_0} = \frac{\sin(H + \phi_0)}{\sin \theta} \Rightarrow \cos \psi \cdot \sin \theta = \cos H$$

1

PROBLEMA

$$\Delta x = \left(\frac{V}{c} \right) \cdot \frac{P \cdot w \cdot \cos \psi}{\cos \delta} = \frac{P_w}{c}$$

$$\Delta \delta = \frac{P_w}{c} \cdot \cos \phi' \cdot \sin \delta \cdot \sin \psi$$



$$\begin{aligned} \Delta x \cdot \cos \delta &= \Delta \theta \cdot \cos \psi \\ -\Delta \delta &= \Delta \theta \cdot \sin \psi \\ \Delta x \cdot \cos \delta &= \frac{V}{c} \cdot \sin \theta \cdot \cos \psi \\ -\Delta \delta &= \frac{V}{c} \cdot \sin \theta \cdot \sin \psi \\ \Delta \theta &= \frac{V}{c} \cdot \sin \theta \end{aligned}$$

$$TSL = H + \delta = H_e + \delta_e$$

$$\delta_e - \delta = H - H_e = -6^{\circ}$$

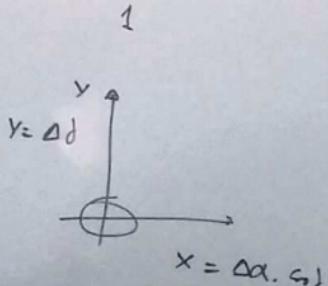
$$-50^{\circ}$$

ABERRACIÓN DIURNA

$$\vec{V} = P \cdot \cos \phi' \cdot w \cdot \hat{E}$$

$$\cos 4$$

$$\frac{\sin(90 + \psi)}{\sin 90^\circ} = \frac{\sin(H + 90)}{\sin \theta} \Rightarrow \cos 4 \cdot \sin \theta = \cos H$$

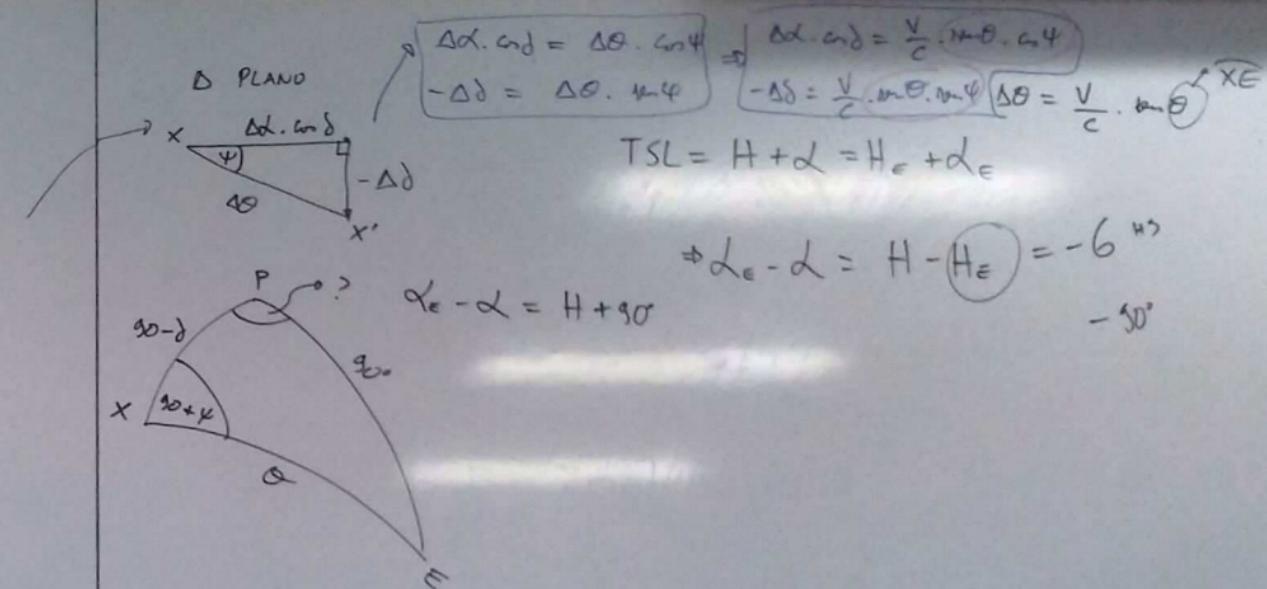


PROBAR

$$\Delta\alpha = \left(\frac{V}{c}\right) \cdot \frac{\cos H}{\cos \delta} = \frac{P_w}{c} \cdot \cos \phi' \cdot \frac{\cos H}{\cos \delta}$$

$$\Delta\delta = \frac{P_w}{c} \cdot \cos \phi' \cdot \tan \delta \cdot \sin H$$

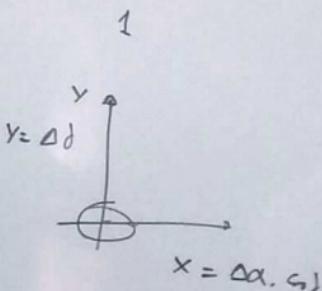
ERRORES



ABERRACIÓN DIURNA

$$\bar{V} = P \cdot \cos \phi' \cdot w \cdot E$$

$$\frac{\cos(90^\circ + \delta)}{\sin 90^\circ} = \frac{\sin(H + 90^\circ)}{\sin \theta} \Rightarrow \cos 90^\circ \cdot \sin \theta = \cos H$$



PROBLEMA

$$\Delta \alpha = \left(\frac{V}{c}\right) \cdot \frac{P \cdot w \cdot \cos \phi'}{\cos \delta} = \frac{P \cdot w}{c} \cdot \cos \phi' \cdot \frac{\cos H}{\cos \delta}$$

$$\Delta \delta = \frac{P \cdot w}{c} \cdot \cos \phi' \cdot \sin \delta \cdot \sin H$$

Ecuación

$$\begin{aligned} \Delta \alpha \cdot \cos \delta &= \Delta \phi \cdot \cos \psi \\ -\Delta \delta &= \Delta \phi \cdot \sin \psi \end{aligned} \Rightarrow \begin{aligned} -\Delta \delta &= \frac{V}{c} \cdot \sin \theta \cdot \cos \psi \\ \Delta \phi &= \frac{V}{c} \cdot \cos \theta \end{aligned}$$

$$TSL = H + \alpha = H_E + \alpha_E$$

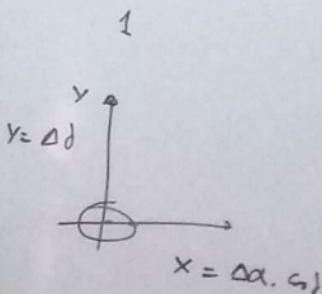
$$\alpha_E - \alpha = H - H_E = -6^{\circ}$$

-50°

ABERRACIÓN DIURNA

$$\frac{\cos(\phi + \psi)}{\sin \theta} = \frac{\cos(H + \phi)}{\sin \theta}$$

$$\Rightarrow \cos \psi = \cos H$$



$$\Delta\alpha = \left(\frac{V}{c} \right) \cdot \frac{\cos H}{\cos \delta} = \frac{P_w}{c} \cdot \cos \phi' \frac{\cos H}{\cos \delta}$$

$$\Delta\delta = \frac{P_w}{c} \cdot \cos \phi' \cdot \tan \delta \cdot \tan H$$

$$\bar{V} = P_w \cos \phi' \cdot \omega \cdot \hat{E}$$

$$\Rightarrow \Delta\alpha \cong 0.0213 \cdot \cos \phi' \cdot \cos H / \sin \delta$$

$$\Delta\delta \cong 0.320 \cdot \cos \phi' \cdot \tan H \cdot \tan \delta$$

POS
OBSERVADAS



ABERRACIÓN DIURNA $\cos 4$ $(90 + \phi)$

$$= \frac{v_m (H + 90)}{\sin \theta} \Rightarrow \cos 4 \cdot v_m \theta = \cos H$$

PROBLEMA

$$\Delta \alpha = \left(\frac{V}{c} \right) \cdot \frac{P_w \cdot \cos \phi'}{\cos \delta} = \frac{P_w}{c} \cdot \cos \phi' \cdot \frac{\cos H}{\cos \delta}$$

$$\Delta \delta = \frac{P_w}{c} \cdot \cos \phi' \cdot \tan \delta \cdot \tan H$$

$$x = \Delta \alpha \cdot \cos \phi$$

EJEMPLO

$$\bar{V} = P_w \cos \phi' \cdot w \cdot \hat{E}$$

$$\Rightarrow \Delta \alpha \cong 0.0213 \cdot \cos \phi' \cdot \cos H / \sin \delta$$

$$\Delta \delta \cong 0.320 \cdot \cos \phi' \cdot \tan H \cdot \tan \delta$$

