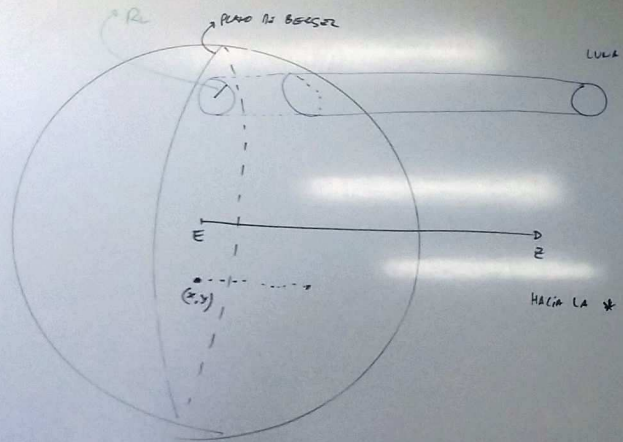


SISTEMA DE BESSEL



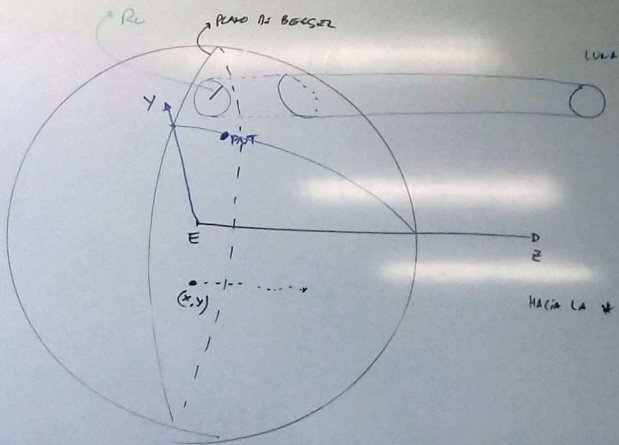
VIERNES 29
PARCIAL

*
ESTRELLA

SISTEMA DE BESSEL

$PQ \in YZ$

$XY \equiv$ PLANO BESSEL



HALLAR COORD. LUNA Y OBSERVADOR (en sist. BESSEL)

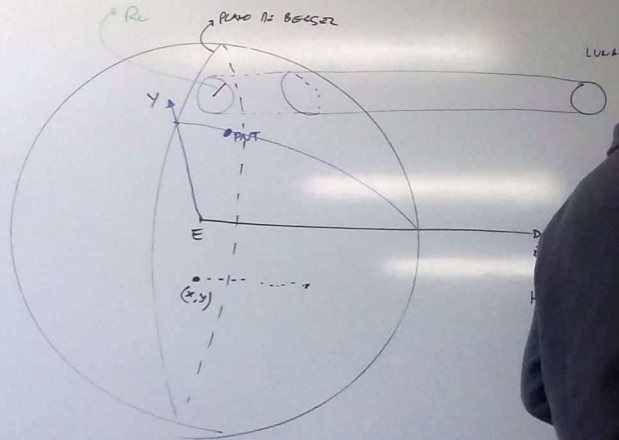
(x, y, z) (s, θ, δ)

VIERNES 29
PARCIAL

SISTEMA DE BESSEL

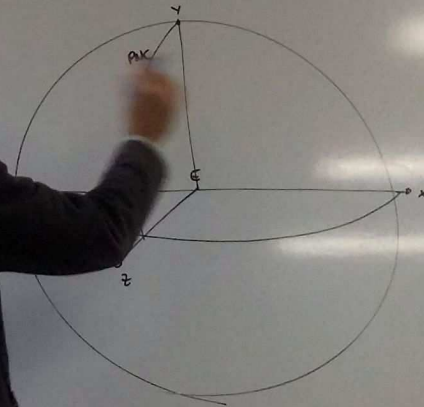
$PN \in YZ$

$XY \equiv$ PLANO BESSEL



(x, y, z) (s, ρ, ψ)
HALLAR COORD. LUNA Y OBSERVADOR (en sist. BESSEL)

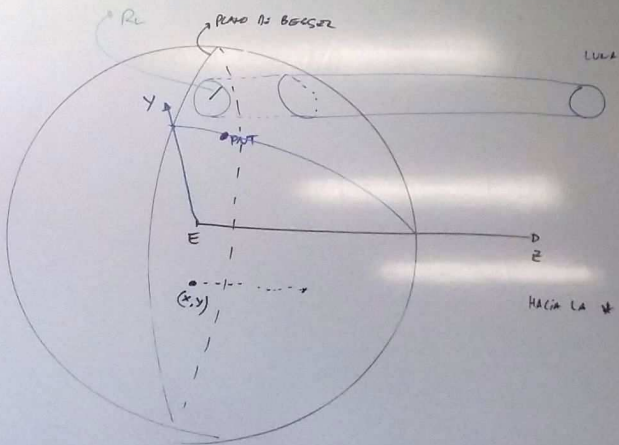
VIERNES 29
PARCIAL



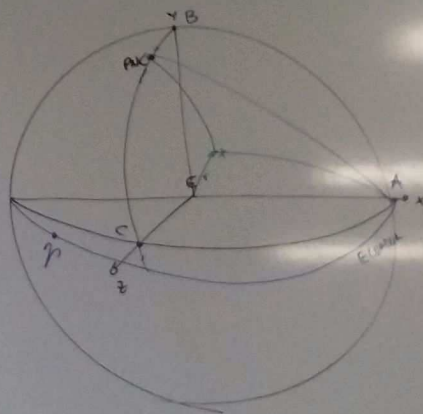
SISTEMA DE BESSEL

$PQ \in YZ$

$XY \equiv$ PLANO BESSEL

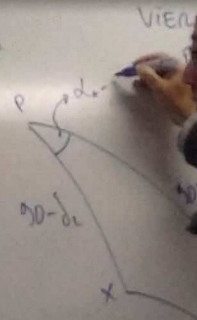


HALLAR COORD. LUNA Y OBSERVADOR (en sist. Bessel)



$$r = R_{\oplus} T - L_{\text{luna}}$$

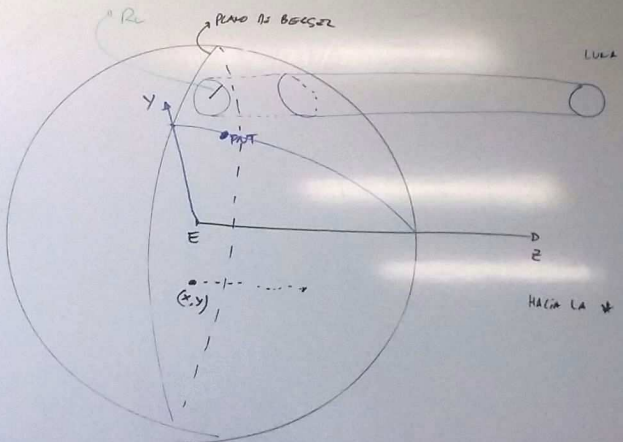
$$\begin{cases} x = r \cos \alpha_X \\ y = r \cos \beta_X \\ z = r \cos \gamma_X \end{cases}$$



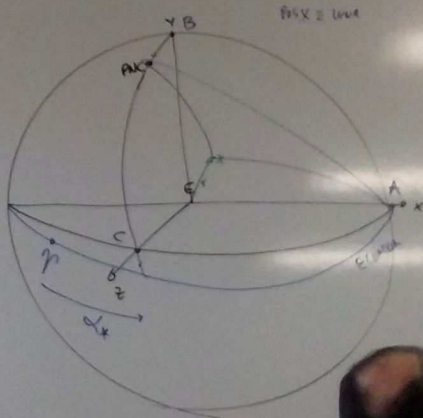
SISTEMA DE BESSEL



$PQ \in YZ$
 $XY \equiv$ PLANO BESSEL



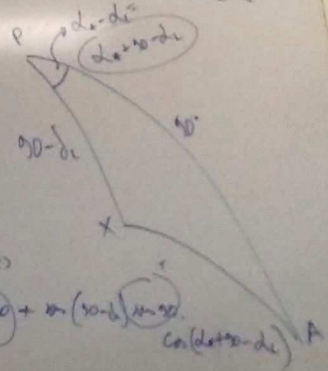
HALLAR COORD. LUNA Y OBSERVADOR (en sist. Bessel)



$r = \text{dist. T-Luna}$

$$\begin{cases} x = r \cdot \cos \widehat{AX} \\ y = r \cdot \cos \widehat{BX} \\ z = r \cdot \cos \widehat{CX} \end{cases}$$

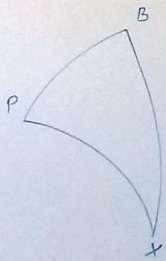
VIERNES 29
 PARCIAL



$$\cos \widehat{AX} = \cos(90 - d_e) \cos(90 - d_i) + \sin(90 - d_e) \sin(90 - d_i) \cos(d_e - d_i)$$

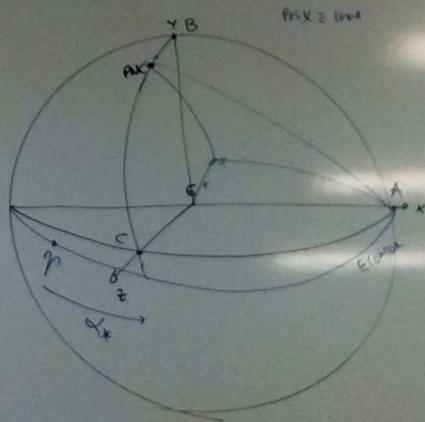
$$\begin{aligned} \cos \widehat{AX} &= \cos d_e \cdot \sin(d_e - d_i) \\ &+ \sin d_e \cdot \sin(d_i - d_e) \end{aligned}$$

SISTEMA DE BESSEL



$$N \rightarrow \Pi_2 = \frac{R_{\oplus}}{r}$$

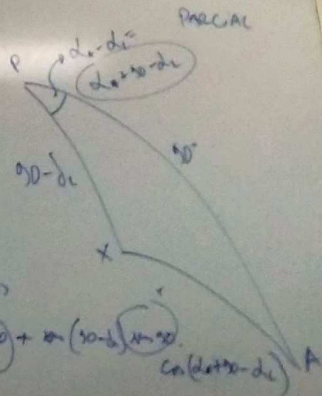
HALLAR COORD. LUNA Y OBSERVADOR (en sist. Bessel)



$r = \text{dist. T-Luna}$

$$\begin{cases} x = r \cdot \cos \widehat{AX} \\ y = r \cdot \cos \widehat{BY} \\ z = r \cdot \cos \widehat{CX} \end{cases}$$

VIENTOS 29



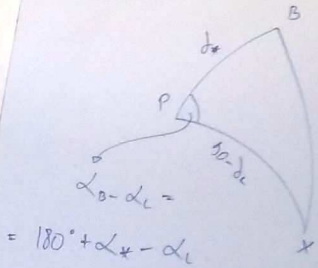
$$\cos \widehat{AX} = \cos(90 - \delta) \cos 90 + \sin(90 - \delta) \sin 90 \cdot \cos(\delta - \delta')$$

$$\cos \widehat{AX} = -\cos \delta \cdot \sin(\delta - \delta')$$

$$X = r \cdot \cos \delta \cdot \sin(\delta - \delta') = \cos \delta \cdot \sin(\delta - \delta') / \cos T$$

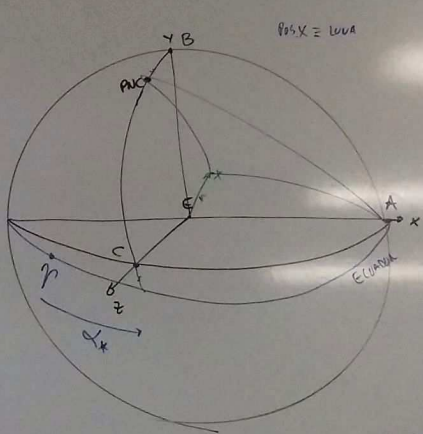
SISTEMA DE BESSEL

$$\sin \pi_2 = \frac{R_{\oplus}}{r}$$



$$\cos(\alpha_{B-dL}) = \cos(\alpha_{X-dL}) + \dots$$

HALLAR COORD. LUNA Y OBSERVADOR (en sist. BESSEL)

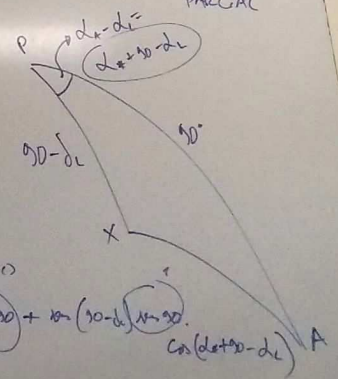


$r = \text{Dist T-Luna}$

$$\begin{cases} x = r \cdot \cos \widehat{AX} \\ y = r \cdot \cos \widehat{BX} \\ z = r \cdot \cos \widehat{CX} \end{cases}$$

VIERNES 29

PARCIAL



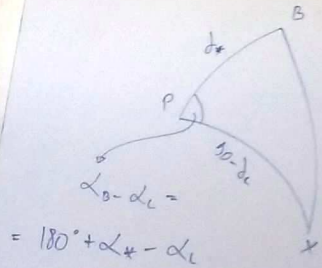
$$\cos \widehat{AX} = \cos(90-dL) \cdot \cos 90 + \sin(90-dL) \cdot \sin 90 \cdot \cos(\alpha_{X-dL})$$

$$\cos \widehat{AX} = -\cos dL \cdot \sin(\alpha_{X-dL})$$

$$X = (r \cdot \cos dL \cdot \sin(\alpha_{L-dL*}) = \cos dL \cdot \sin(\alpha_{L-dL*}) / \sin \pi_2$$

SISTEMA DE BESSEL

$$\mu \rightarrow \pi_l = \frac{R_{\oplus}}{r}$$

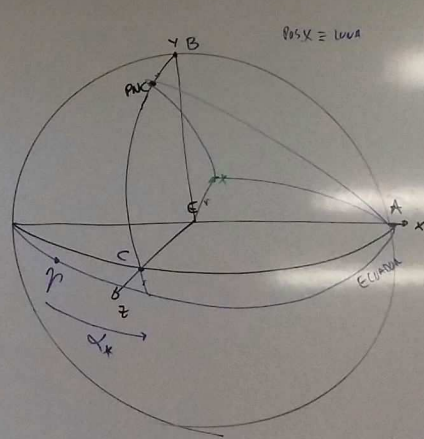


$$\begin{aligned} \cos BX &= \cos d_* \cdot \cos(90-d_l) - \sin d_* \sin(90-d_l) \cdot \cos(d_*-d_l) \\ &= \cos d_* \sin d_l - \sin d_* \cos d_l \cos(d_*-d_l) \end{aligned}$$

EN RADIOS TERRESTRES:

$$\begin{aligned} X &= \cos d_l \cdot \sin(d_*-d_l) / \mu \pi_l \\ Y &= [\cos d_* \sin d_l - \sin d_* \cos d_l \cdot \cos(d_*-d_l)] / \mu \pi_l \end{aligned}$$

HALLAR COORD. LUNA Y OBSERVADOR (en sist. Bessel)

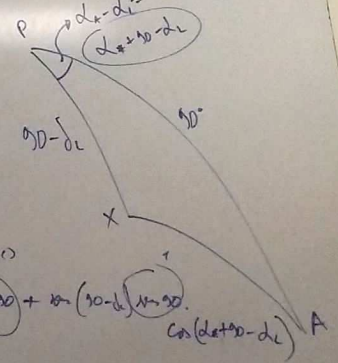


$r = \text{dist T-Luna}$

$$\begin{cases} x = r \cdot \cos \widehat{AX} \\ y = r \cdot \cos \widehat{BX} \\ z = r \cdot \cos \widehat{CX} \end{cases}$$

VIERNES 29

PARCIAL

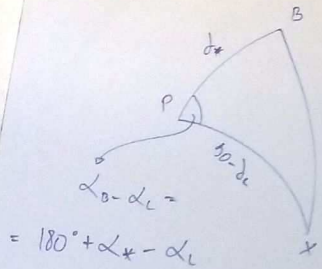


$$\cos AX = \cos(90-d_l) \cdot \cos 90 + \sin(90-d_l) \sin 90 \cdot \cos(d_*-d_l)$$

$$\begin{aligned} \cos AX &= -\cos d_l \cdot \sin(d_*-d_l) \\ X &= (r \cdot \cos d_l \cdot \sin(d_l-d_*)) = \cos d_l \cdot \sin(d_l-d_*) / \mu \pi_l \end{aligned}$$

SISTEMA DE BESSEL

$$\sin \pi_i = \frac{R_{\oplus}}{r}$$

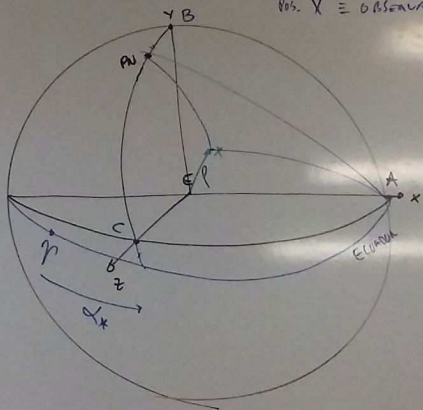


$$\begin{aligned} \cos BX &= \cos d_* \cdot \cos(d_0 - d_C) - \sin d_* \sin(90 - d_C) \cdot \cos(d_* - d_C) \\ &= \cos d_* \cos d_C - \sin d_* \cos d_C \cos(d_C - d_*) \end{aligned}$$

En radios terrestres:

$$\begin{aligned} X &= \cos d_C \cdot \sin(d_C - d_*) / \sin \pi_i \\ Y &= [\cos d_* \sin d_C - \sin d_* \cos d_C \cdot \cos(d_C - d_*)] / \sin \pi_i \end{aligned}$$

HALLAR COORD. LUNA Y OBSERVADOR (en sist. BESSEL)

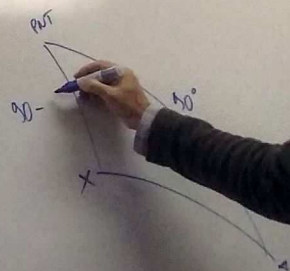


Pos. X \equiv OBSERVADOR

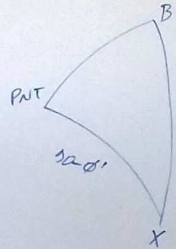
$$\xi = \rho \cdot \cos \alpha_X$$

$$\eta = \rho \cdot \cos \beta_X$$

VIERNES 29
PARCIAL

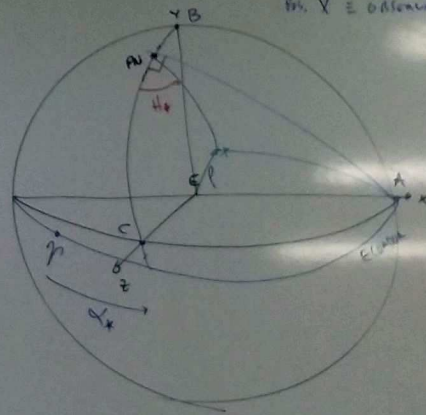


SISTEMA DE BESSEL



$$\sin \pi_c = \frac{R_\oplus}{r}$$

HALLAR COORD. LUNA Y OBSERVADOR (en sist. Bessel)

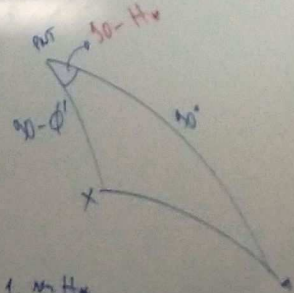


fil. X = observador

$$\xi = \rho \cdot \cos AX$$

$$\eta = \rho \cdot \sin BX$$

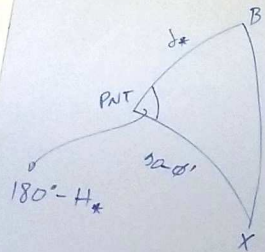
VIERNES 29
PARCIAL



$$\cos AX = 0 + \cos \phi' \cdot 1 \cdot \sin H_0$$

$$\xi = \frac{\rho}{R_\oplus} \cdot \cos \phi' \cdot \sin H_0 \quad (\text{en sus TERA})$$

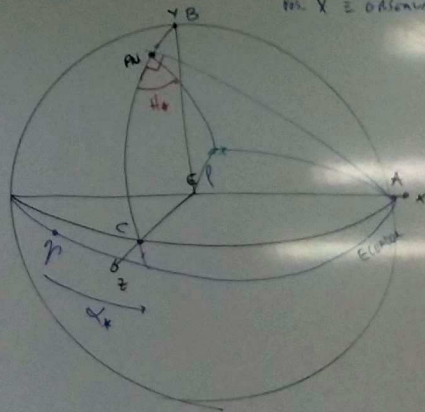
SISTEMA DE BESSEL



(X, Y) LUNA
 (ξ, η) OBSERVADOR
 } EN FUNCIÓN DE t

$$r = \frac{R_{\oplus}}{r}$$

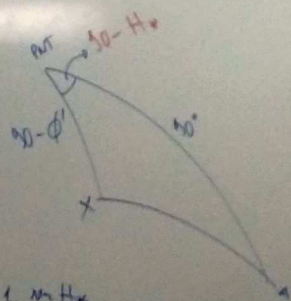
HALCAR COORD. LUNA Y OBSERVADOR (en sist. Bessel)



$\text{en } X \equiv \text{OBSERVADOR}$
 $\xi = \rho \cdot \cos \alpha X$
 $\eta = \rho \cdot \sin \alpha X$

VIERNES 29

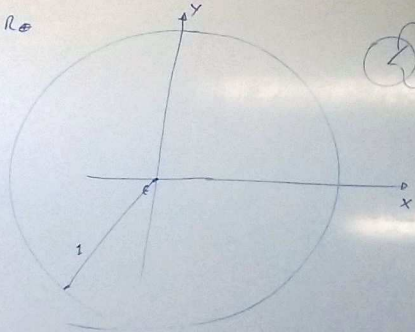
PERCAL



$$\cos \alpha X = 0 + \cos \delta' \cdot t \cdot \sin H_0$$

$$\xi = \frac{\rho \cdot \cos \delta' \cdot \sin H_0}{R_{\oplus}} \quad (\text{en sus TOPO})$$

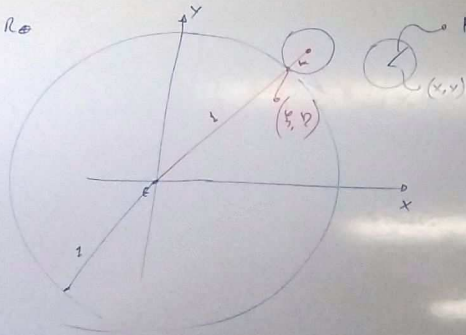
UNIDAD DIST.: R_{\oplus}



$K = \frac{R_L}{R_{\oplus}}$
 (x, y)

VIERNES 29
MAYO

UNIDAD DIST.: R_{\oplus}

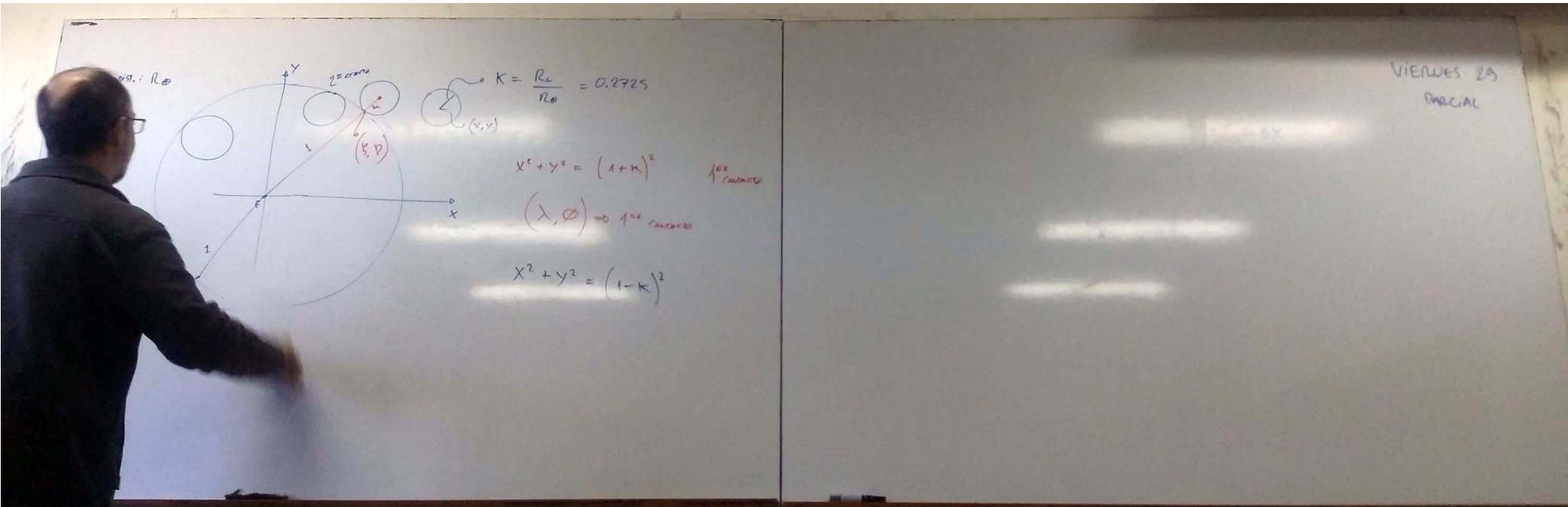


$$K = \frac{R_L}{R_{\oplus}} = 0.2725$$

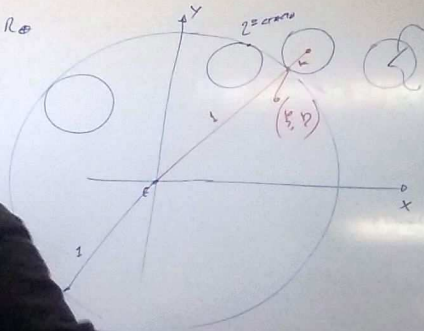
$$x^2 + y^2 = (1+K)^2 \quad \uparrow \text{1}^{\text{er}} \text{ CONTACTO}$$

$$(x, \varphi) \Rightarrow \uparrow \text{2}^{\text{do}} \text{ CONTACTO}$$

VIERNES 29
MARCAL



dist.: R_0



2 circulos

$$K = \frac{R_L}{R_0} = 0.2725$$

(x, y)

(ξ, η)

$$X^2 + Y^2 = (1+k)^2 \quad \uparrow \text{1}^{\text{er}} \text{ circulo}$$

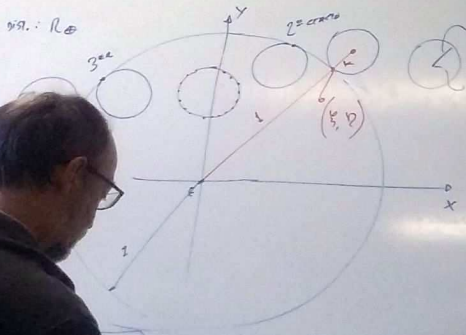
$(\lambda, \phi) \rightarrow \text{1}^{\text{er}} \text{ circulo}$

$$X^2 + Y^2 = (1-k)^2$$

VIERVES 29
PRCAL

VIERNES 29
DARCA

UNIDAD 99: R_E



$$K = \frac{R_L}{R_E} = 0.2725$$

$$x^2 + y^2 = (1+K)^2 \quad \begin{matrix} 1^{er} \text{ CONTACTO} \\ 4^{to} \end{matrix}$$

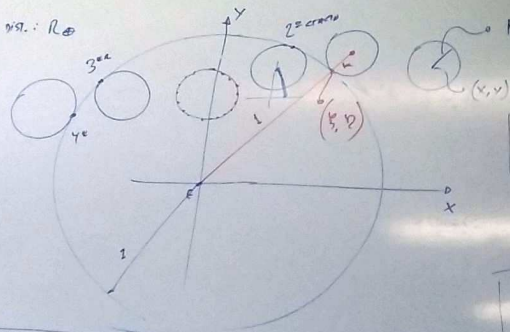
$$(\lambda, \varphi) \Rightarrow 1^{er} \text{ CONTACTO}$$

$$x^2 + y^2 = (1-K)^2 \quad \begin{matrix} 2^{da}, 3^{er} \text{ CONTACTO} \end{matrix}$$

1040

2023P

UNIDAD DIST.: R_{\oplus}



$$K = \frac{R_L}{R_{\oplus}} = 0.2725$$

$$x^2 + y^2 = (1 + K)^2 \quad \text{1er CONTACTO, } 4^{\text{to}}$$

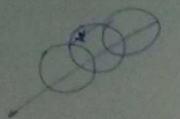
$(x, y) \rightarrow$ 1er CONTACTO

$$X^2 + Y^2 = (1 - K)^2 \quad \text{2do, 3er CONTACTO}$$

LÍNEA DE CENTRALIZACIÓN

(ξ, η, ζ) CORRESP. A (x, y)

VIERNES 29
PARCAL

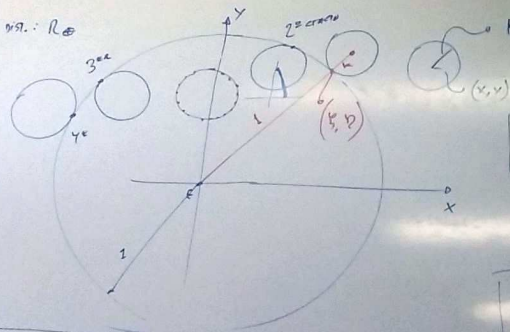


DADO $(x, \phi) \rightarrow \zeta(t), \eta(t)$ y longitudin (ou $X(t), Y(t)$)

$$\text{Si } (\zeta - X)^2 + (\eta - Y)^2 \leq K^2 \Rightarrow \text{HAY OCULTACION}$$

VIERNES 29
MARZ

UNIDAD DIST.: R_{\oplus}



$$K = \frac{R_L}{R_{\oplus}} = 0.2725$$

$$x^2 + y^2 = (1+K)^2 \quad \text{1er CONTACTO, } 4^{\text{to}}$$

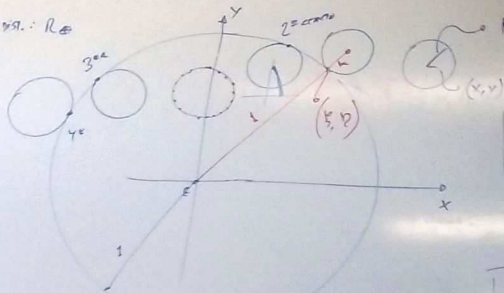
$$(x, \phi) \rightarrow \text{1er CONTACTO}$$

$$x^2 + y^2 = (1-K)^2 \quad \text{2do, 3er CONTACTO}$$

LÍNEA DE CENTRALIZACIÓN

$$(g, p, \psi) \text{ CORRESP. A } (x, y)$$

UNIDAD ASTR.: R_{\oplus}



$$K = \frac{R_L}{R_{\oplus}} = 0.2725$$

$$x^2 + y^2 = (1+K)^2 \quad \begin{matrix} 1^{er} \\ \text{CONTACTO} \end{matrix}, \quad 4^{to}$$

$$(x, y) \Rightarrow 1^{er} \text{ CONTACTO}$$

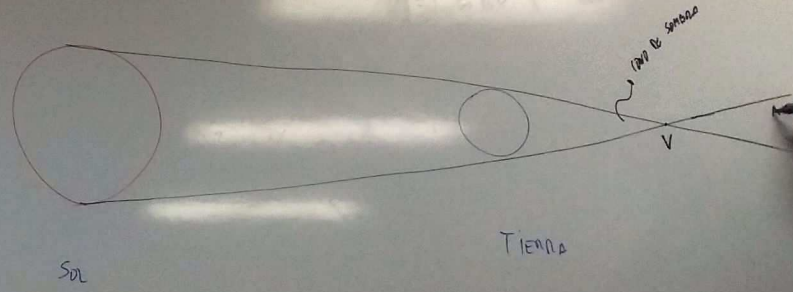
$$x^2 + y^2 = (1-K)^2 \quad \begin{matrix} 2^{do}, 3^{er} \\ \text{CONTACTO} \end{matrix}$$

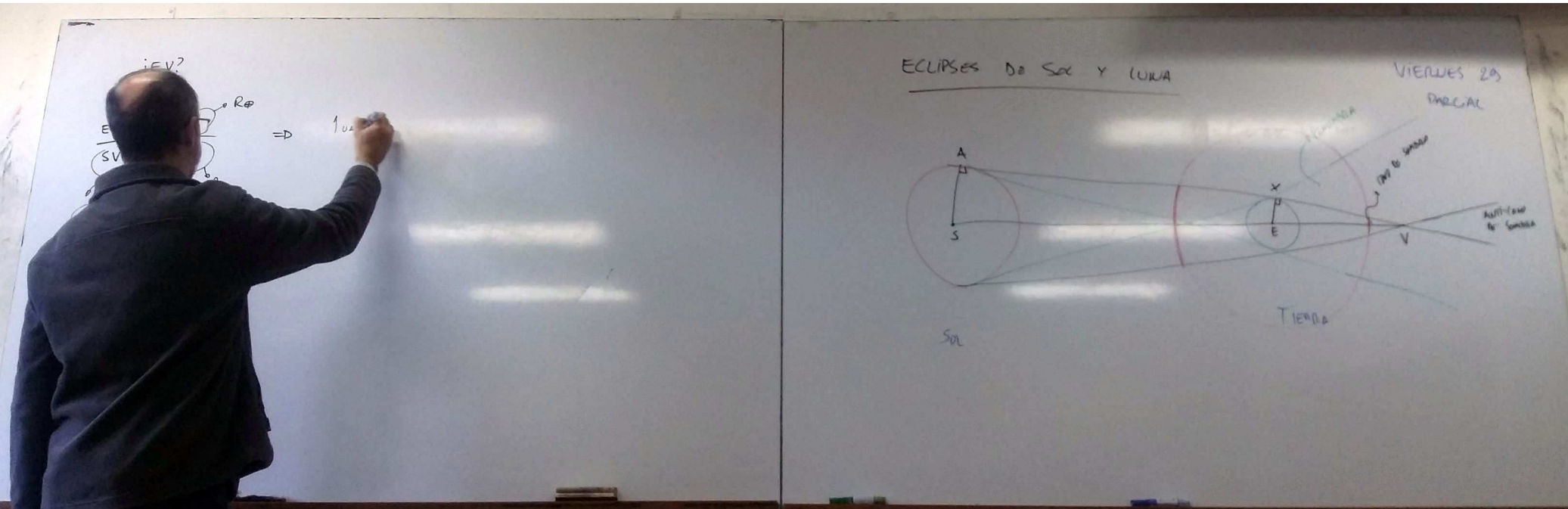
LÍNEA DE CENTRALIDAD

$$\left(\frac{x}{1+K}, \frac{y}{1+K} \right) \text{ CORRESP. A } (x, y)$$

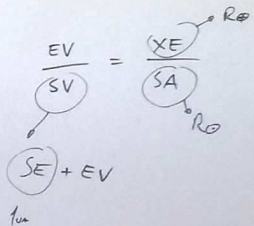
ECLIPSES DE SOL Y LUNA

VIERNES 29
PARCIAL





¿EV?



$$\frac{EV}{SV} = \frac{XE}{SA} \Rightarrow \frac{1ua + EV}{EV} = \frac{R_{\odot}}{R_{\oplus}}$$

$$\frac{1ua}{EV} = \frac{R_{\odot}}{R_{\oplus}} - \frac{R_{\oplus}}{R_{\oplus}} \Rightarrow EV = \frac{R_{\oplus}}{\frac{R_{\odot}}{R_{\oplus}} - 1} \text{ uas} \approx 9,3 \times 10^3 \text{ uas}$$

$\frac{R_{\odot} - R_{\oplus}}{R_{\oplus}}$
 $\downarrow \quad \quad \downarrow$
 $696000 \quad \quad 6400$

ECLIPSES DE SOL Y LUNA

VIERNES 29
PARCIAL

