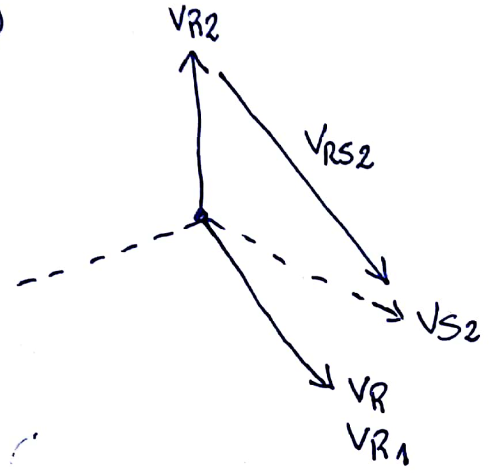
EP Prueba 1 JUL 2018

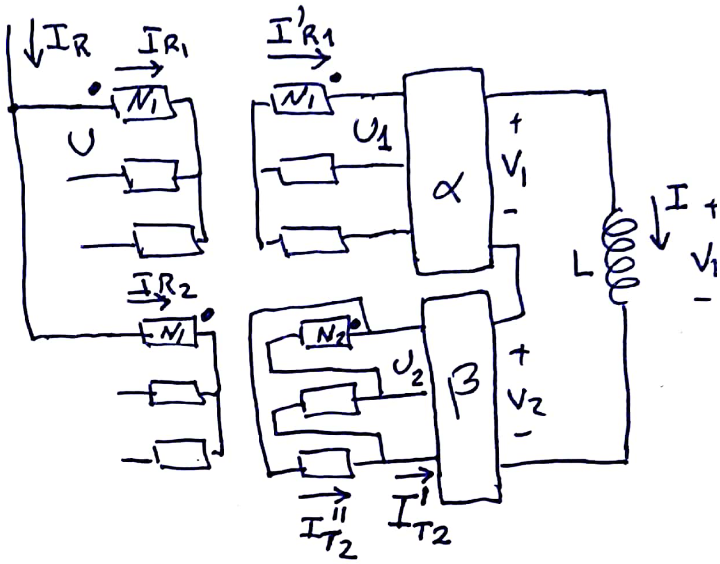
1) $\langle V_L \rangle = 0$ en régimen $\langle V_L\rangle = \langle V_1\rangle + \langle V_2\rangle$

DEL TRAFO Yy $U_1 = U$ // DEL TRAFO Yd y $N_2 = N_1\sqrt{3} \Rightarrow U_2 = U$

$\Rightarrow \langle V_L\rangle = \frac{3}{\pi} U\sqrt{2}\,(\cos\alpha + \cos\beta) = 0 \Rightarrow \beta = \pi - \alpha$ $\boxed{\beta = 180^\circ}$

2)





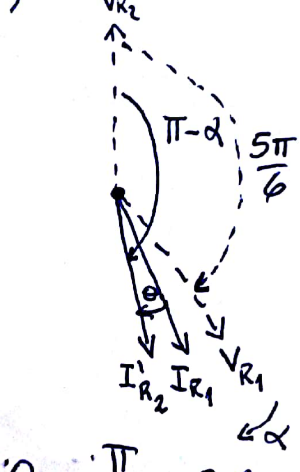
3) POR SER TRAFOS IDEALES $\begin{cases} I_{R_1} = I'_{R_1} \text{ etc} \\ (A)\; I_{R_2} = -I''_{R_2}\sqrt{3} \text{ etc} \end{cases}$ $\quad I''_{R_2} + \underbrace{I''_{S_2} + I''_{T_2}}_{*} = 0$

POR NUDOS $\begin{cases} I_{R_2} + I_{S_2} + I_{T_2} = 0 \\ I'_{R_2} = I''_{R_2} - I''_{T_2} \\ I'_{S_2} = I''_{S_2} - I''_{R_2} \end{cases}$ $\quad I'_{R_2} - I'_{S_2} = I''_{R_2} \underbrace{- I''_{T_2} - I''_{S_2}}_{*} + I''_{R_2} \Rightarrow$

$I''_{R_2} = \frac{1}{3}\left(I'_{R_2} - I'_{S_2}\right)$ (B)

$\Rightarrow$ DE (A) y (B) $\quad I_{R_2} = \frac{1}{\sqrt{3}}\left(I'_{S_2} - I'_{R_2}\right) \Rightarrow \boxed{I_R = I_{R_1} + \frac{1}{\sqrt{3}}\left(I'_{S_2} - I'_{R_2}\right)}$

4)



$\theta = \frac{\pi}{6} - 2\alpha$

$\Rightarrow I''_{R_2} = I_{R_1}\, e^{-jn\left(\frac{\pi}{6} - 2\alpha\right)}$

y como $I''_{S_2} = I''_{R_2}\, e^{-j\frac{2\pi}{3}n}$

$\Rightarrow$

$I_R = I_{R_1}\left\{1 + \frac{1}{\sqrt{3}} e^{-jn\left(\frac{\pi}{6} - 2\alpha\right)}\left(1 - e^{-j\frac{2\pi}{3}n}\right)\right\}$

como $1 - e^{-j\frac{2\pi}{3}n} \begin{cases} \sqrt{3}\, e^{j\pi/6} & \dot{3}+1 \\ \sqrt{3}\, e^{-j\pi/6} & \dot{3}-1 \end{cases}$

$\boxed{I_R = I_{R_1}\left(1 + e^{-j(\pi/6 - 2\alpha)n \pm j\pi/6}\right)}$

5)

$I_R(5) = I_{R_1}(5)\cdot \underbrace{\left(1 + e^{-j\left(\frac{\pi}{6} - 2\alpha\right)5 - j\frac{\pi}{6}}\right)}_{z}$

LUEGO $I_{R_1}(5) = \frac{\sqrt{6}}{5} I$ (CUASICUADRADA)

$\Rightarrow$

$\boxed{I_R(5)_{ef} = \frac{\sqrt{6}}{5}\,|z|\,I}$