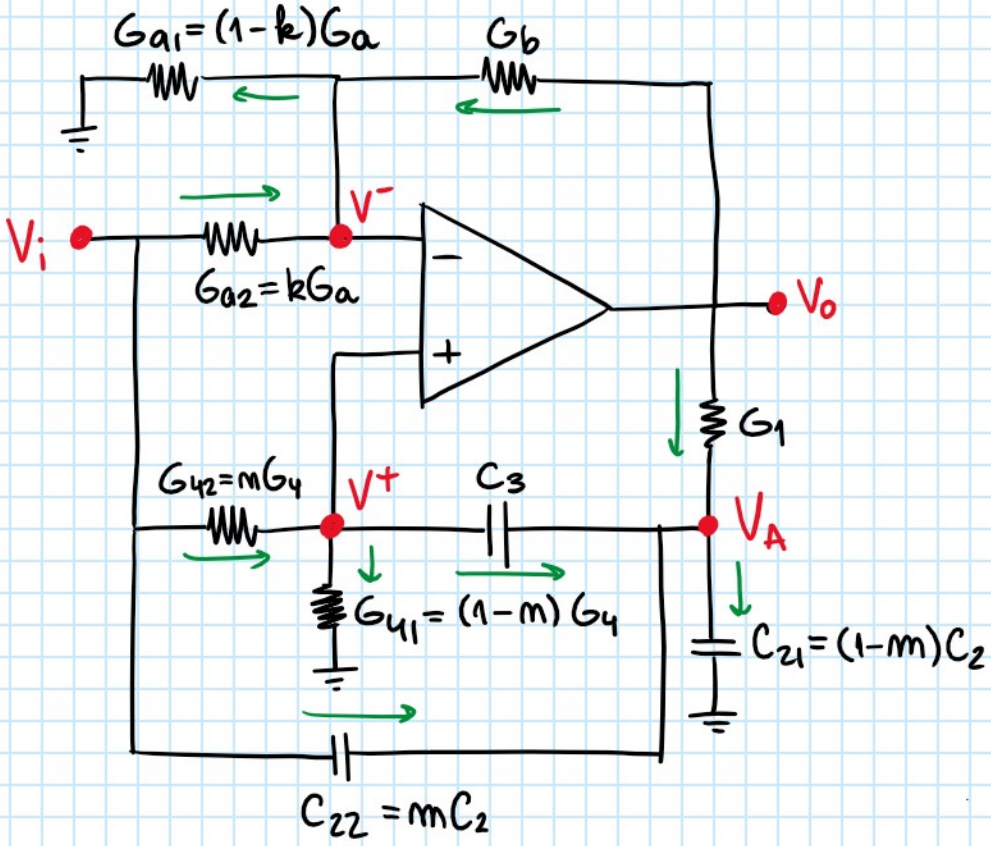
Transferencia sedra hpb

Sunday, October 28, 2018 1:03 AM

Sedra:
sallen key 936 937
Schmidtt trigger 996 998
Phase margin 725 728 740



$$V_o = (V^+ - V^-)\cdot A_{vol} = V^+ \cdot A_{vol} - V^- \cdot A_{vol}$$

NODO V^-: $(V_i - V^-)G_{a2} + (V_o - V^-)G_b - V^- G_{a1} = 0$

$$V_i G_{a2} + V_o G_b = V^-(G_a + G_b)$$

$$V^- = \frac{V_i G_{a2} + V_o G_b}{G_a + G_b} = V_i \underbrace{\frac{G_{a2}}{G_a+G_b}}_{\Downarrow 1} + V_o \underbrace{\frac{G_b}{G_a+G_b}}_{\Downarrow 2}$$

NODO V_A:

$$(V_o - V_A)G_1 + (V^+ - V_A)\$C_3 + (V_i - V_A)\$C_{22} = \$C_{21} V_A$$

$$V_o G_1 + V^+ \$C_3 + V_i \$C_{22} = V_A \underbrace{(\$C_2 + \$C_3 + G_1)}_{(\bigstar)}$$

$$V_A = V_o \frac{G_1}{(\bigstar)} + V^+ \frac{\$C_3}{(\bigstar)} + V_i \frac{\$C_{22}}{(\bigstar)} \quad \{EC.\alpha\}$$

NODO V^+:

$$(V_i - V^+) G_{42} = V^+ \cdot G_{41} + (V^+ - V_A) \$C_3$$

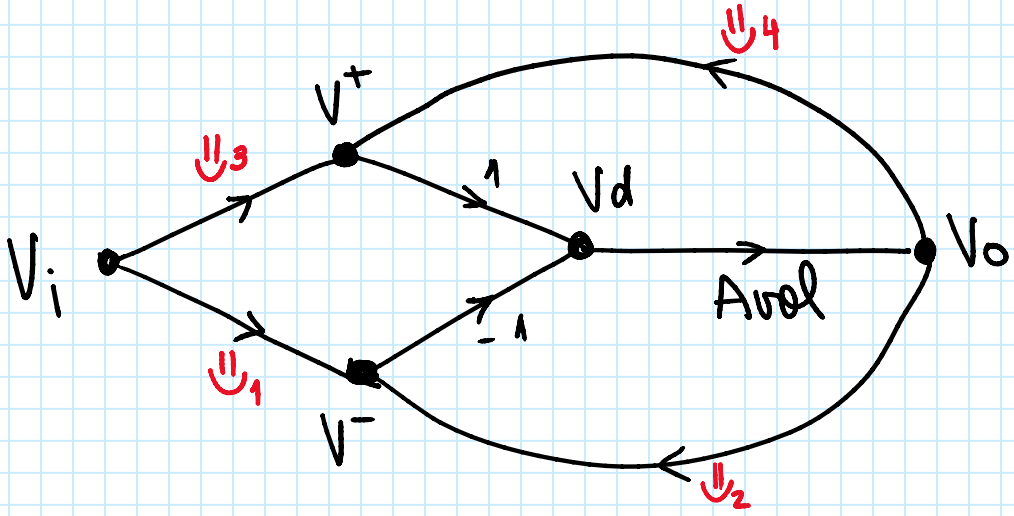
$$V_i G_{42} + \$C_3 V_A = V^+ (G_4 + \$C_3)$$

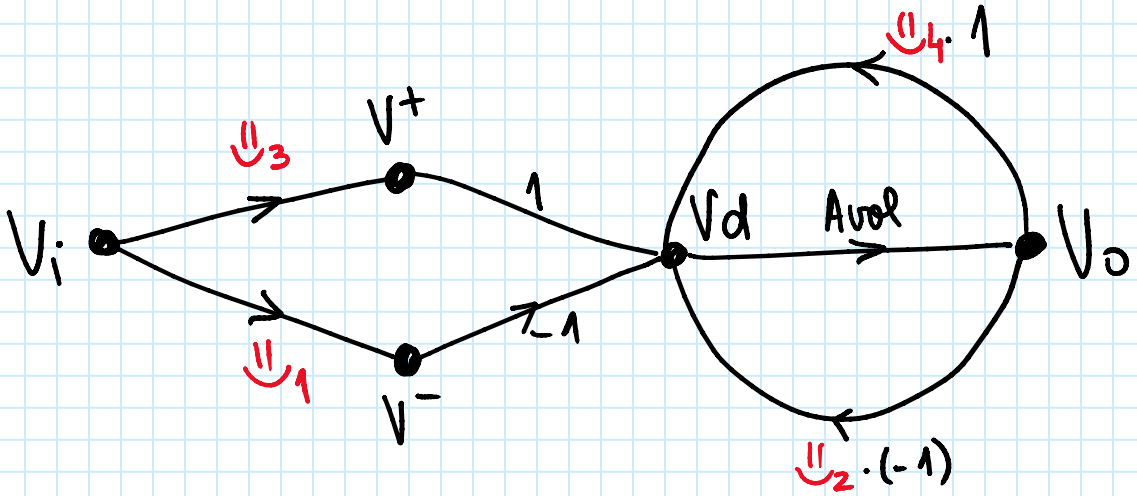
$$V^+ = V_i \frac{G_{42}}{G_4 + C_2} + V_A \underbrace{\frac{\$C_3}{G_4 + C_2}}_{(\heartsuit)}$$

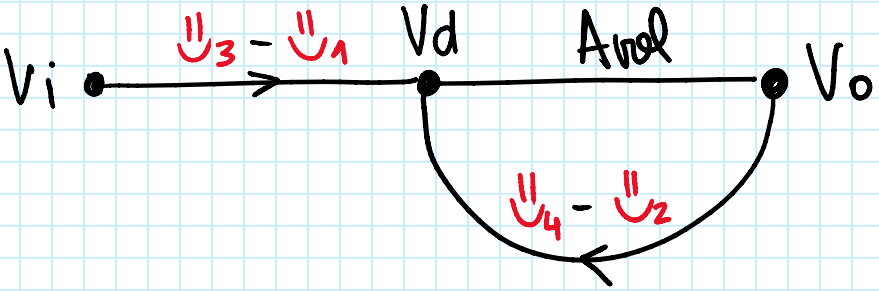
Reemplazando con EC. α:

$$V^+ = V_i \frac{G_{42}}{G_4 + C_2} + V_o \cdot \frac{G_1}{(\bigstar)} \cdot (\heartsuit) + V^+ \frac{\$C_3}{(\bigstar)} (\heartsuit) + V_i \frac{\$C_{22}}{(\bigstar)} (\heartsuit)$$

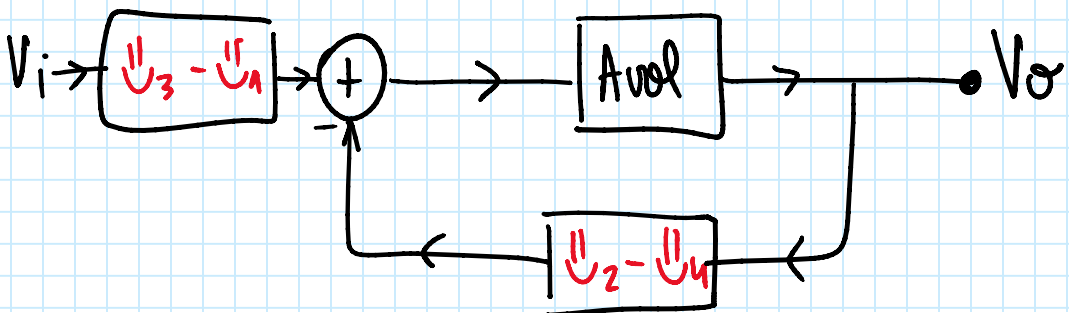
$$V^+ = \underbrace{\frac{\frac{G_{42}}{G_4 + C_2} + \$C_{22} \frac{(\heartsuit)}{(\bigstar)}}{1 - \$C_3 \frac{(\heartsuit)}{(\bigstar)}}}_{=3} V_i + \underbrace{\frac{G_1 \frac{(\heartsuit)}{(\bigstar)}}{1 - \$C_3 \frac{(\heartsuit)}{(\bigstar)}}}_{=4} V_o$$

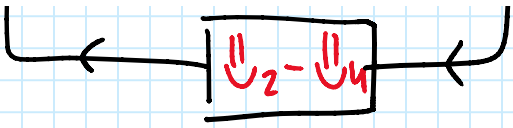

V_i
V^+
V^-
V_d
V_o
A_{vol}
1
-1
$\Vdash_3$
$\Vdash_1$
$\Vdash_4$
$\Vdash_2$


V_i
V^+
V^-
V_d
A_{vol}
V_o
1
-1
$\Vdash_3$
$\Vdash_1$
$\Vdash_4 \cdot 1$
$\Vdash_2 \cdot (-1)$


V_i
$\Vdash_3 - \Vdash_1$
V_d
A_{vol}
V_o
$\Vdash_4 - \Vdash_2$

III


V_i
$\Vdash_3 - \Vdash_1$
+
−
A_{vol}
V_o
$\Vdash_2 - \Vdash_4$



loop gain: $L(\$) = A_{vol} \cdot (\mathcal{U}_2 - \mathcal{U}_4)$ → determina la estabilidad

closed loop gain: $A_{CL}(\$) = (\mathcal{U}_3 - \mathcal{U}_1) \cdot \frac{A_{vol}}{1 - A_{vol}(\mathcal{U}_4 - \mathcal{U}_2)}$

$L(\$)$ es indep. de los capacitores

$\Rightarrow$ la estabilidad es indep. de los capacitores.

$$\mathcal{U}_1 = \frac{G_{a2}}{G_a + G_b}$$

$$\mathcal{U}_2 = \frac{G_b}{G_a + G_b}$$

$$\mathcal{U}_3 = \frac{\frac{G_{u2}}{G_4 + C_2} + \$C_{22}\frac{(\heartsuit)}{(\bigstar)}}{1 - \$C_3\frac{(\heartsuit)}{(\bigstar)}}$$

$$\mathcal{U}_4 = \frac{G_1\frac{(\heartsuit)}{(\bigstar)}}{1 - \$C_3\frac{(\heartsuit)}{(\bigstar)}}$$

$$(\heartsuit) = \frac{\$C_3}{G_4 + C_2}$$

$$(\bigstar) = \$C_2 + \$C_3 + G_1$$

PA MATLAB