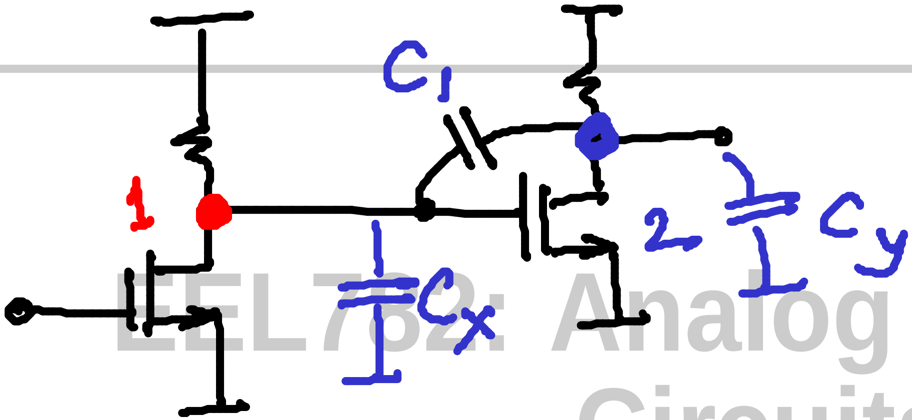

EEL782: Analog Integrated Circuits

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January-May 2009

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$P_1 \rightarrow$ Use Miller

$P_2 \rightarrow 1/g_{m_2}$, $C_x + C_y$

$$C_1 = \frac{g_{m_1}}{g_{m_2}} \cdot \frac{(C_x+C_y)}{\tan\phi}$$

Zero at input node : g_{m_1}/C_{gd_1}

Zero at int. node : $g_{m_2}/C_1 = \dfrac{g_{m_2}^2}{g_{m_1}} \cdot \dfrac{1}{(C_x+C_y)\tan\phi}$

BAD NEWS! $= \dfrac{g_{m_2}}{g_{m_1}\tan\phi} \cdot p_2$

Desired scenario

$$P_1 \ll P_2 \ll z_1 , z_2$$

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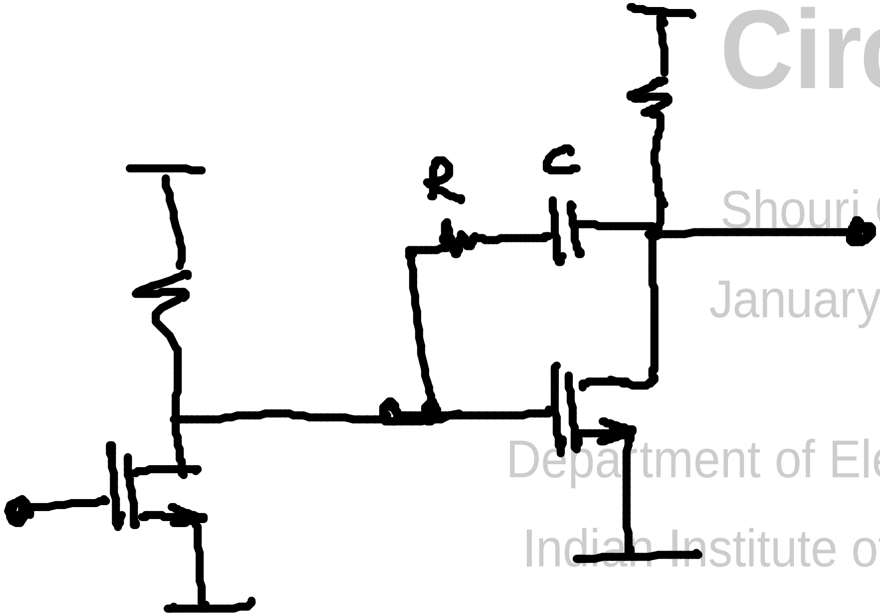

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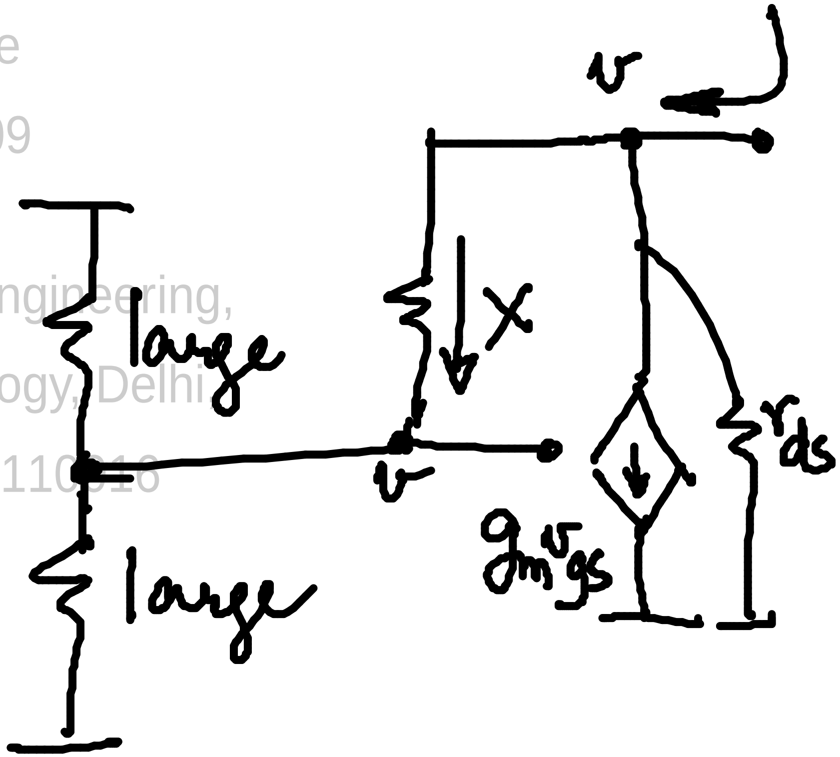

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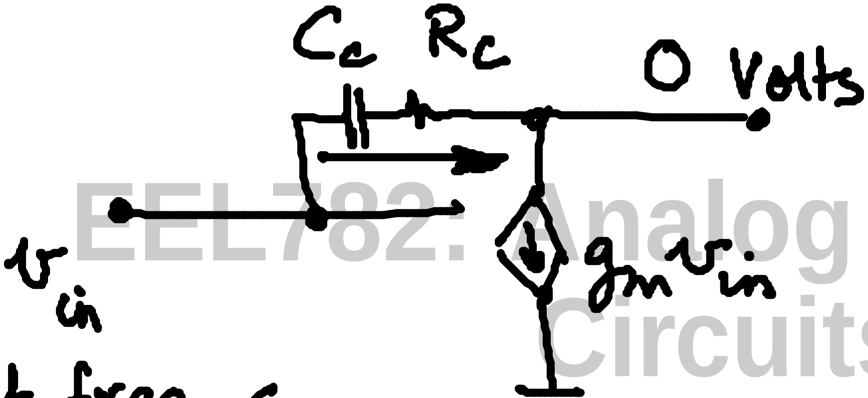

at freq s_Z

$$\cancel{v_{in}} = g_m \cancel{v_{in}} \left(R_C + \frac{1}{s_Z C_C} \right)$$

$$s_Z = \frac{1}{\left(\frac{1}{g_m} - R_C \right) C_C}$$

$R_C < 1/g_m$ RHP zero

$R_C = 1/g_m \rightarrow$ no zero

$R_C > 1/g_m \rightarrow$ LHP zero

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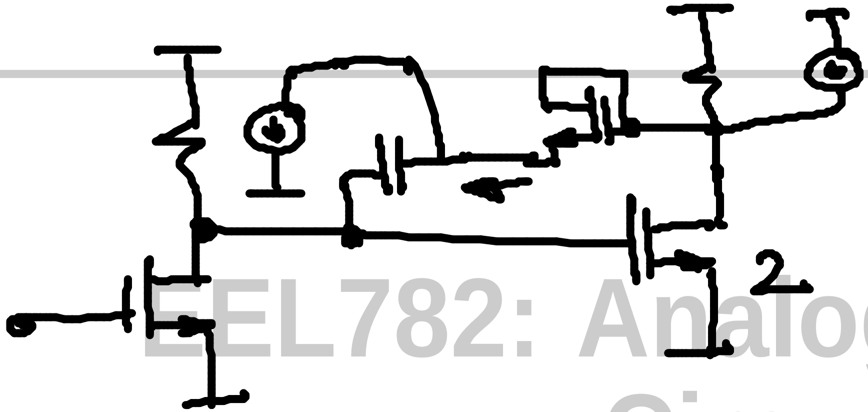

"bleed" current through M_3 .

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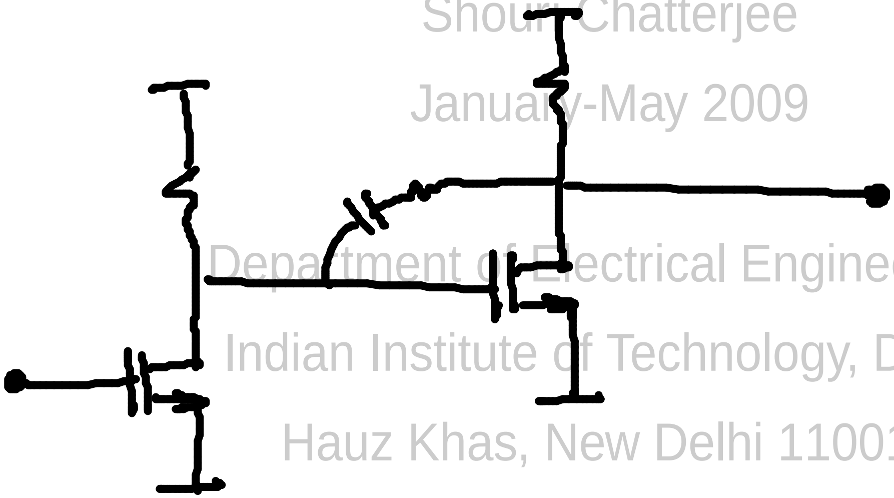

Low freqs :

Two stages

High DC gain

High freqs :

One stage

low output R

low gain