FIG 13:

*BECAUSE FOR FIGURE 11 I CHOSE $V_{S1} = 200mV$, I WILL HAVE THE SAME GAIN AS IN THAT PART.

$A_d = -4.68 V/V$

ALSO, CURRENT WILL BE THE SAME SO I CAN CALCULATE I_{REF}.

$V_{ov} = 200mV$

$I_{TAIL} = 348\mu A = I_{REF}$

PART 3

$$A_{cc} = \frac{R_o}{\frac{1}{g_m} + 2R_{TAIL}}$$

FIG 11:

$I_{TAIL} = 348\mu A$

$g_m = 1.49mS$

$R_{TAIL} = \infty$

$R_o = 3.143k\Omega$

$A_{cc} = 0 V/V$

FROM SIMULATION:

$A_{cc} = 0 V/V$

FIG 12:

$R_{TAIL} = 140.85\Omega$

$g_m = 1.51mS$

$R_o = 3.332k\Omega$

$A_{cc} = 3.53 V/V$

FROM SIMULATION:

$A_{cc} = 3.64 V/V$

FIG 13:

$R_{TAIL} = r_{ON} = 125k\Omega$ ← FROM SIMULATION

$I_{TAIL} = 348\mu A$

$R_o = 3.143k\Omega$

$g_m = 1.49mS$

$A_{cc} = 0.0125 V/V$

FROM SIMULATION:

$A_{cc} = 0.016 V/V$