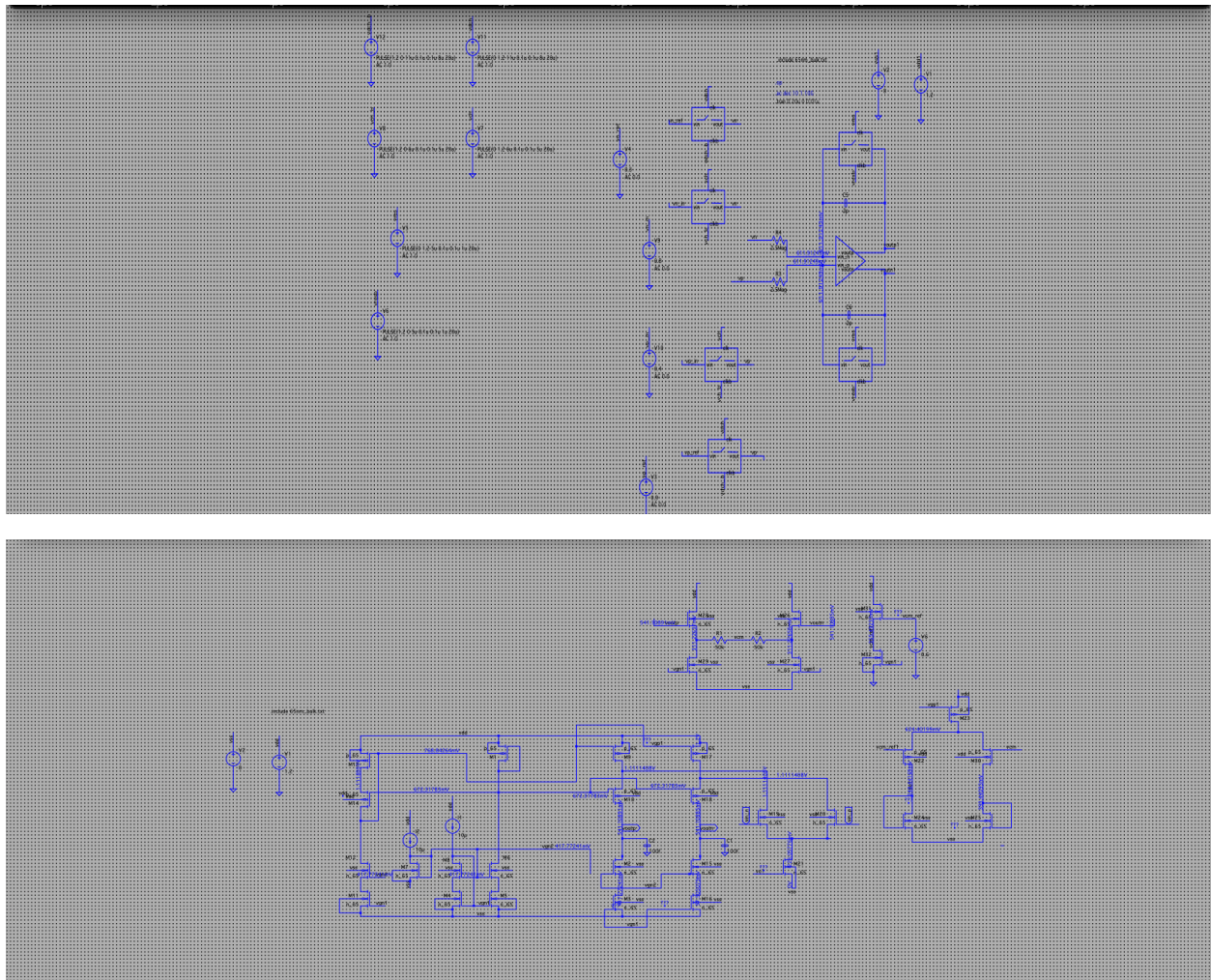VLSI Summer School Project Documentation 2025

Group Member:Krrish Kumar(23EE10033)
                        Kushagra Poonia(23EE10036)
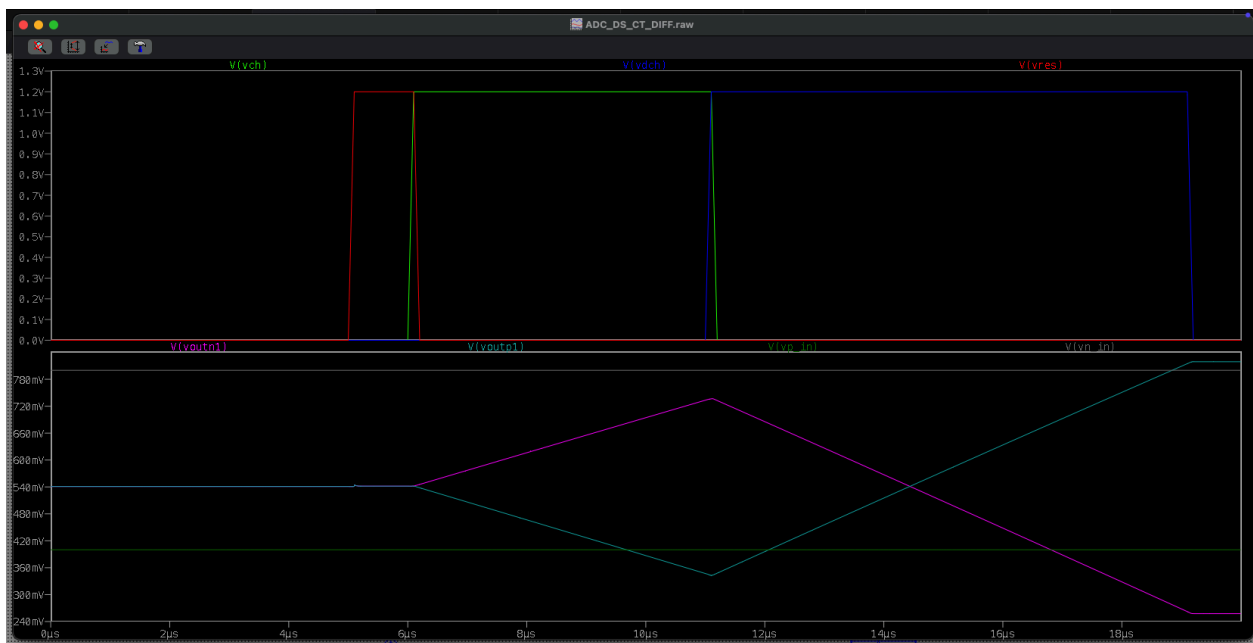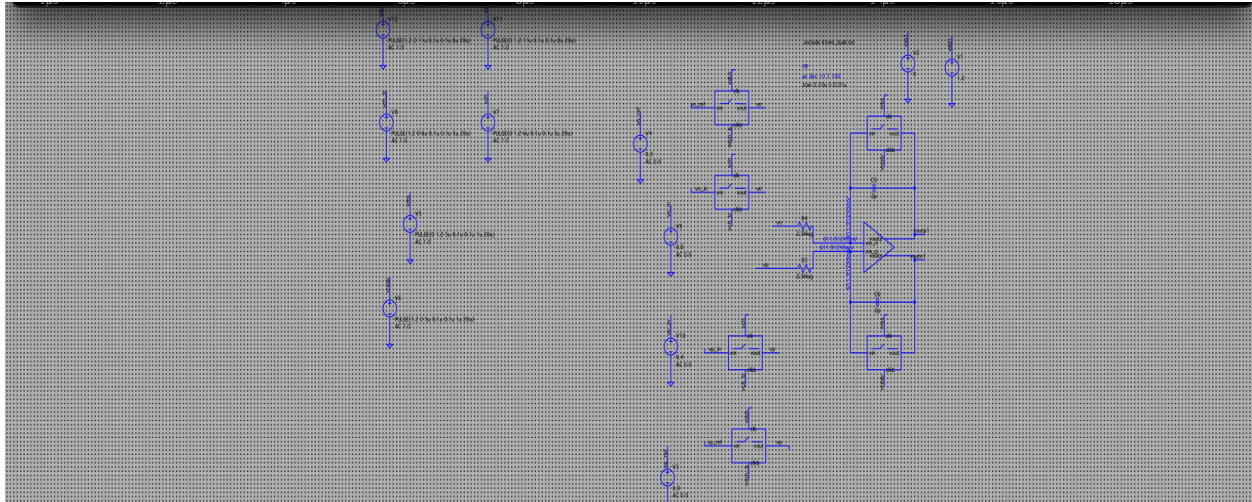
Assignment 8: ADC_DS_CT

● Circuit Diagram:

Internal circuit

Assignment 8: ADC_DS_CT

1)Transient simulations:

1st plot plane:

Charging (v_ch,green) , Discharging(v_dch,blue)
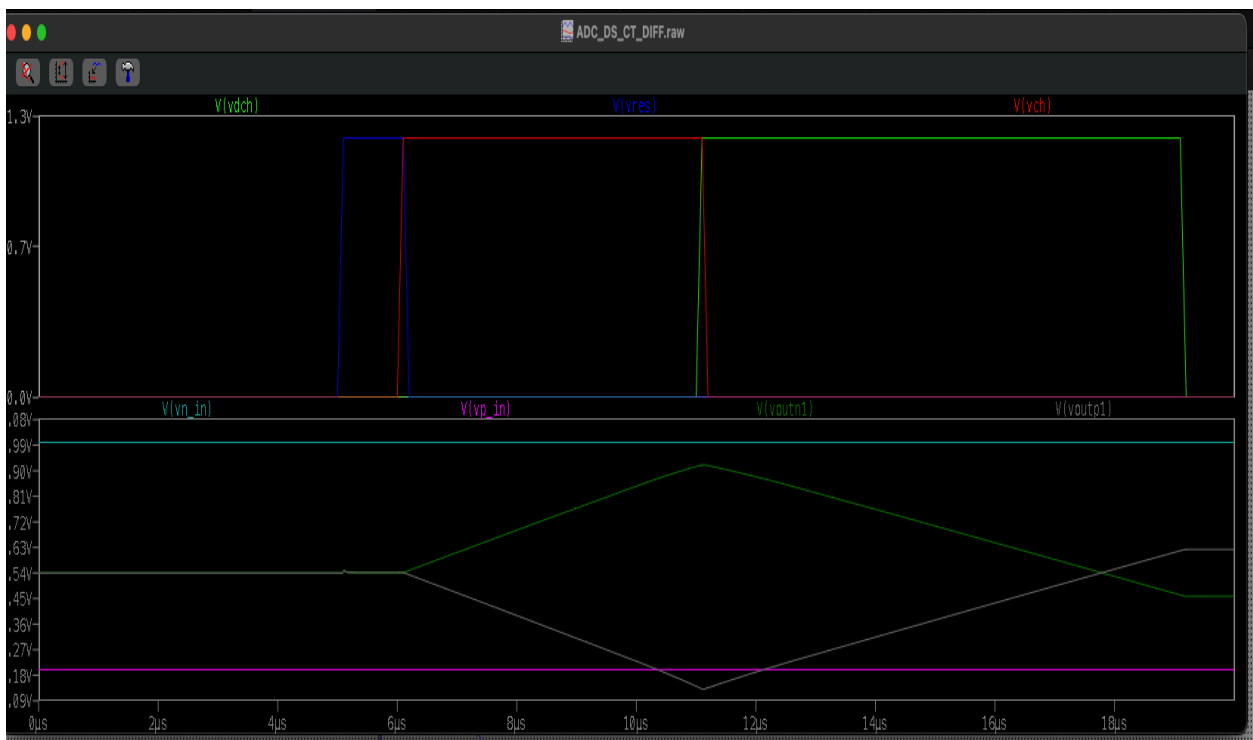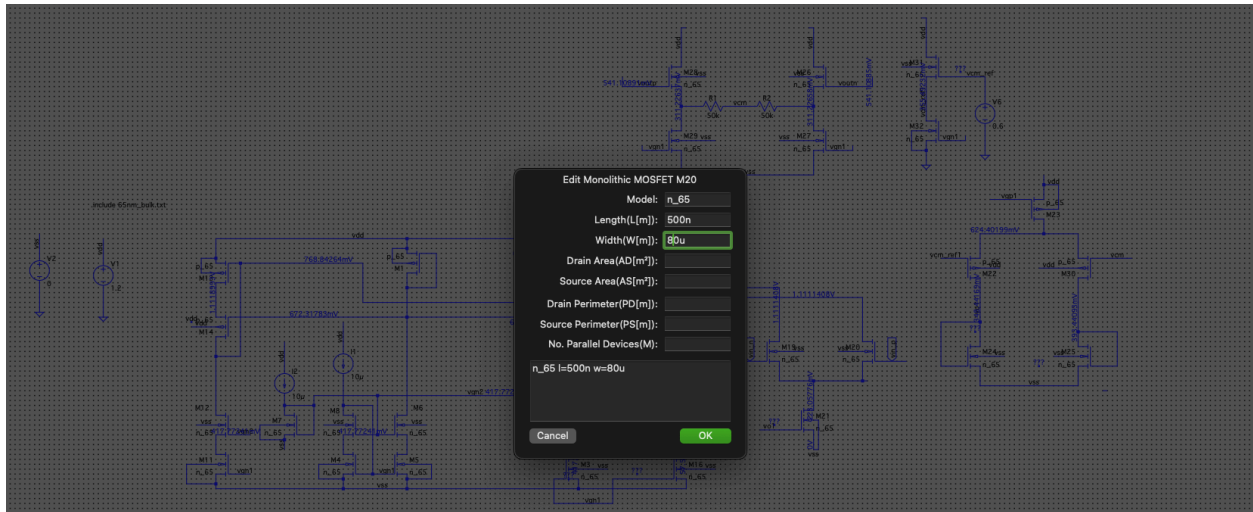 and Reset (red).

2nd plot plane :

Input voltages   :- vp_in(green) and vn_in (grey)

Output voltages :- vout_p1 (skyblue) and vout_n1 (pink)

Assignment 8: ADC_DS_CT

2)Transient simulations:

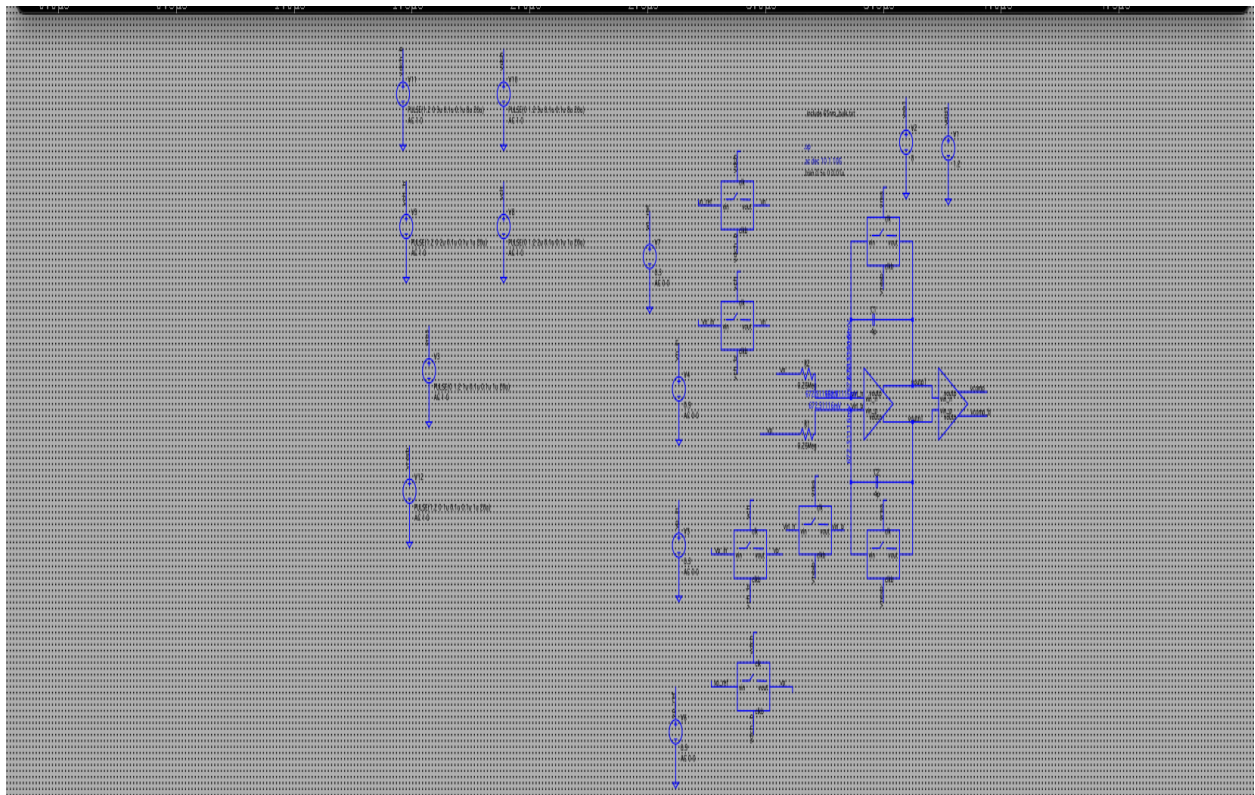Changing mosfet specifications (values of W and L).

Here , we also change the input values from 400mV to 200mV and 800mV to 1V.

Assignment 8: ADC_DS_CT

2)Transient simulations:

We have another circuit for this simulation which is the faster version of this circuit.
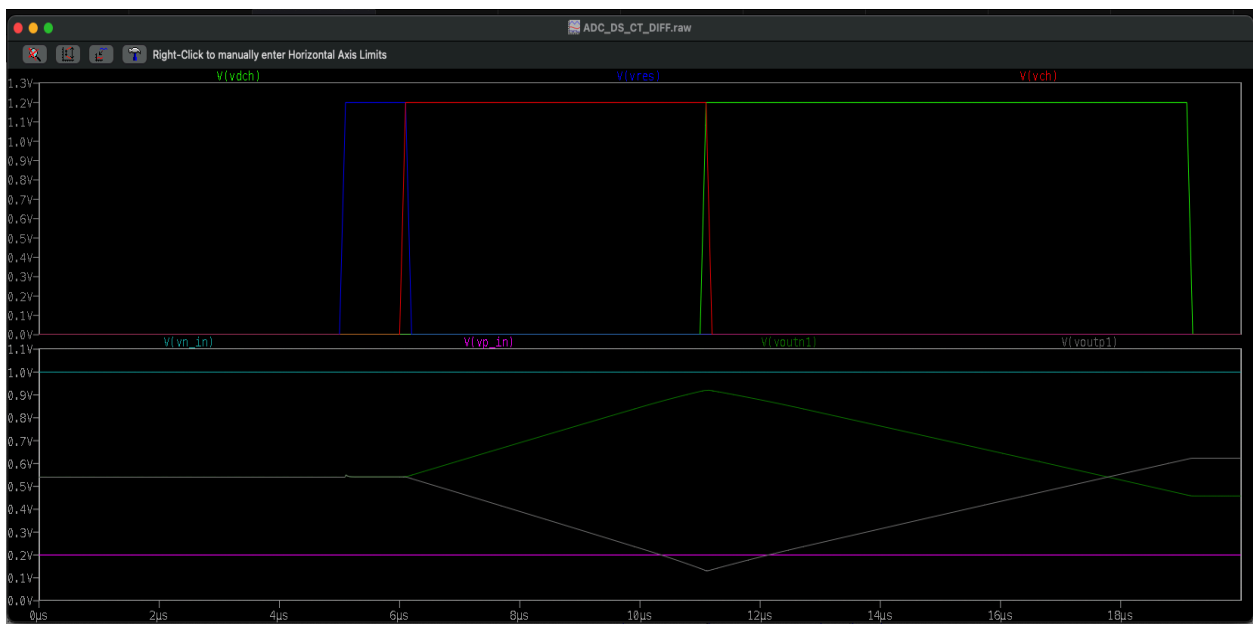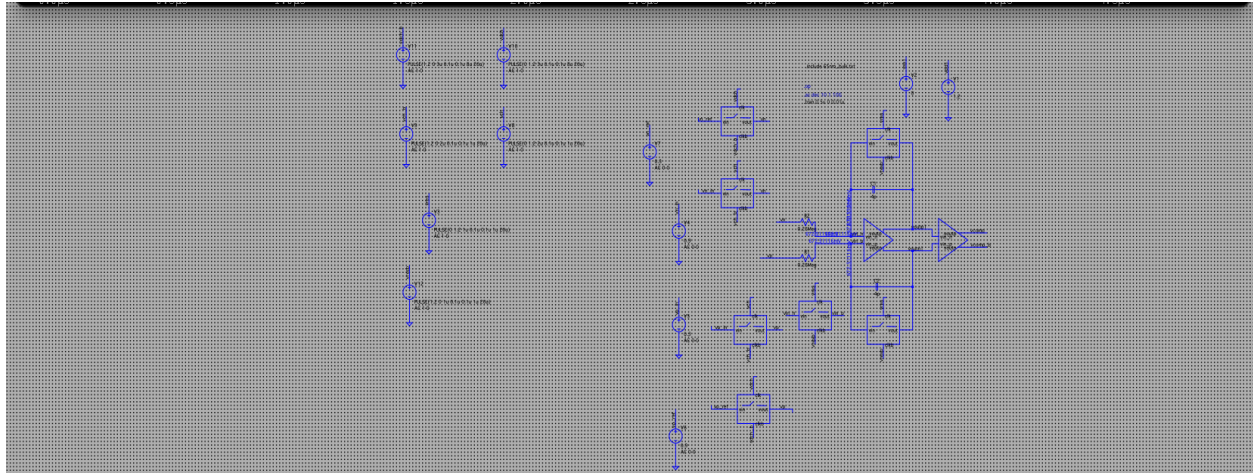
Circuit Diagram :

In this circuit ,resistance value is 0.25Meg ohm and capacitor value is doubled i.e 4pF which means that the time constant (RC) value is decreased by 5x ,so the charging and discharging operation would become faster.

Assignment 8: ADC_DS_CT

2)Transient simulations:

1st plot plane:

Charging (v_ch, red) , Discharging(v_dch, green)
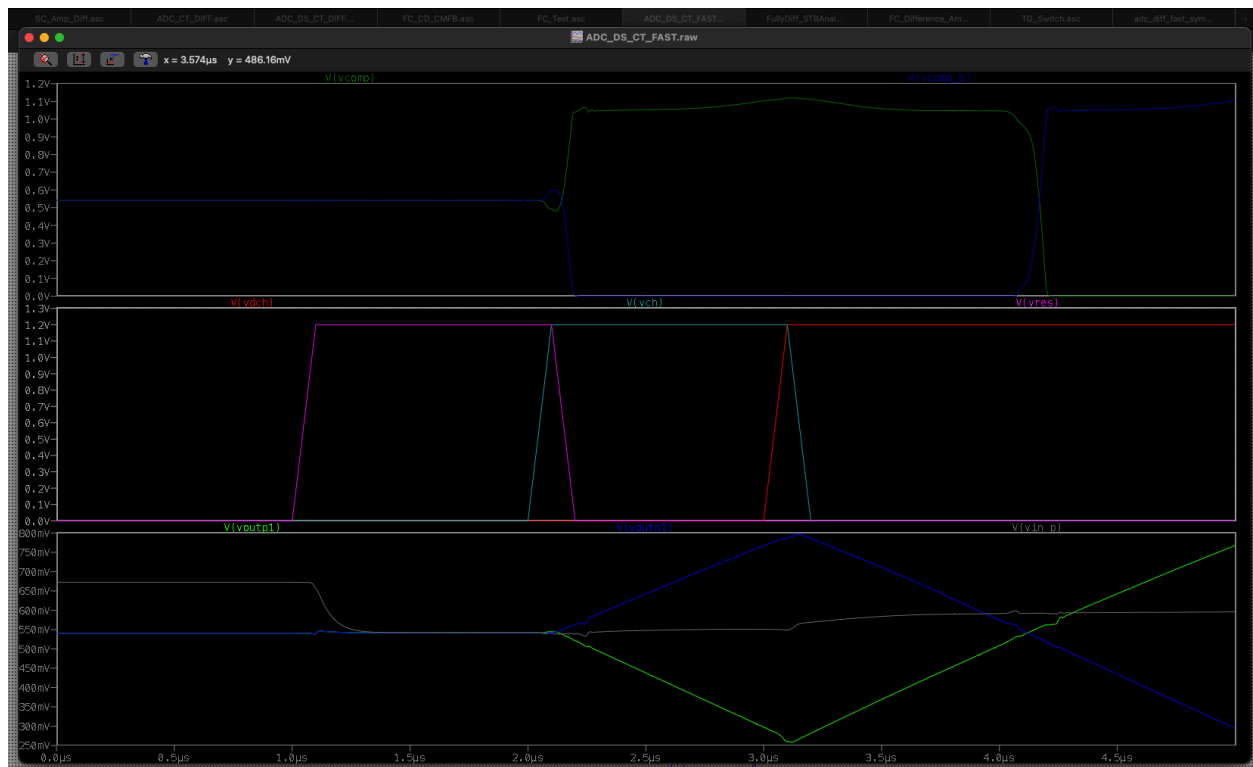 and Reset (blue).

2nd plot plane :

Input voltages   :- vp_in(pink) and vn_in (skyblue)

Output voltages :- vout_p1 (grey) and vout_n1 (green)

Assignment 8: ADC_DS_CT

2)Transient simulations:

Simulation of that same circuit containing the comparator outputs and common mode value also.

1st plot plane :

Output voltages :- v_comp (green) and vcomp_b (blue)

3rd plot plane :

Common reference voltage : mid grey line in the plot

Output voltages :- vout_n1 (blue) and vout_p1 (green)