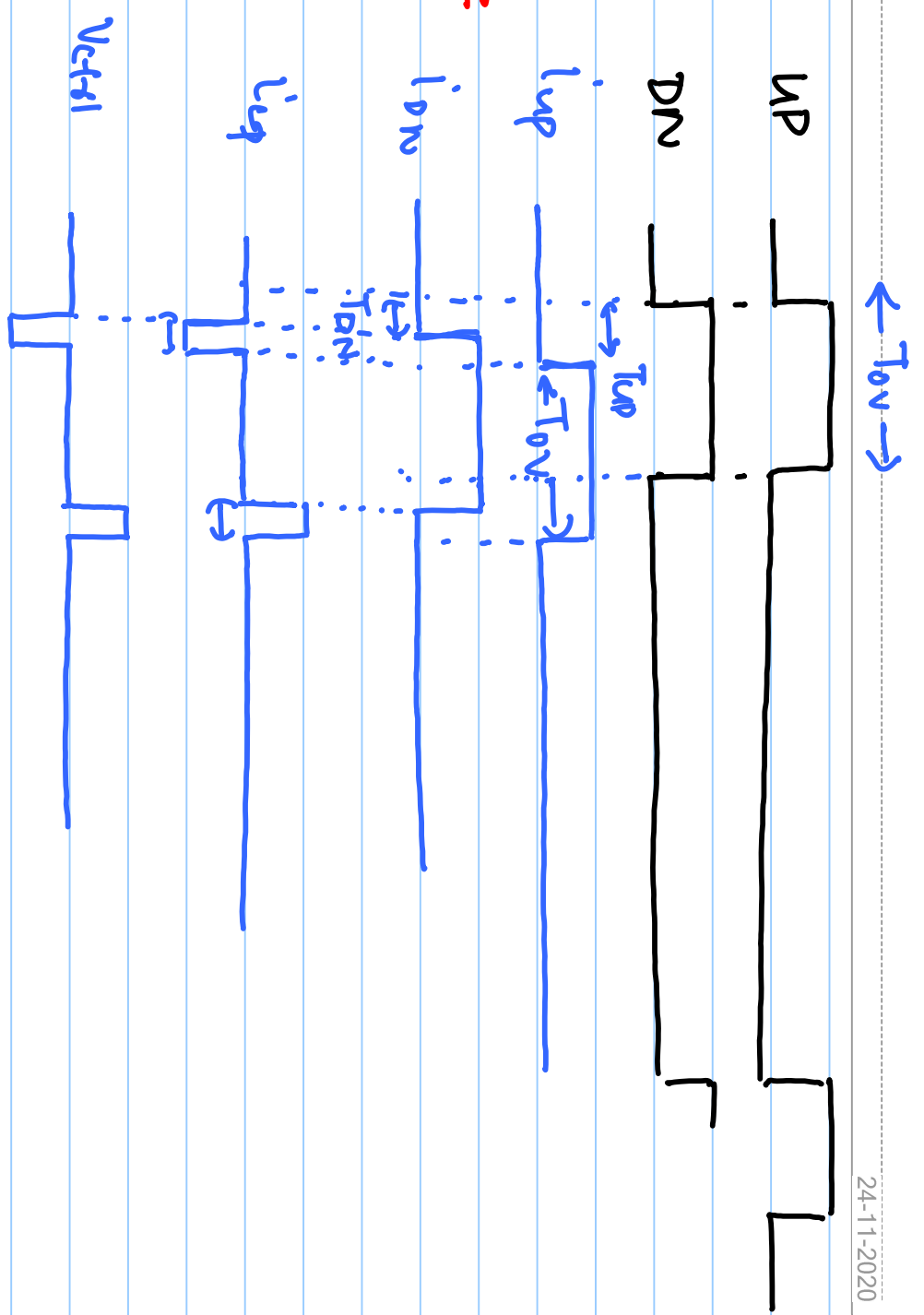
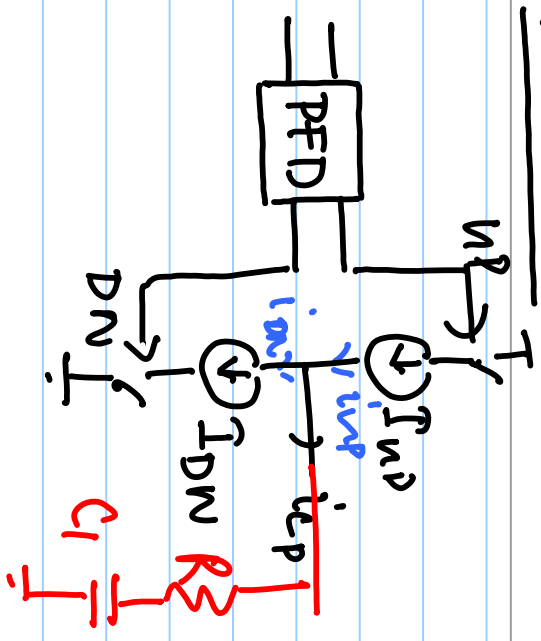
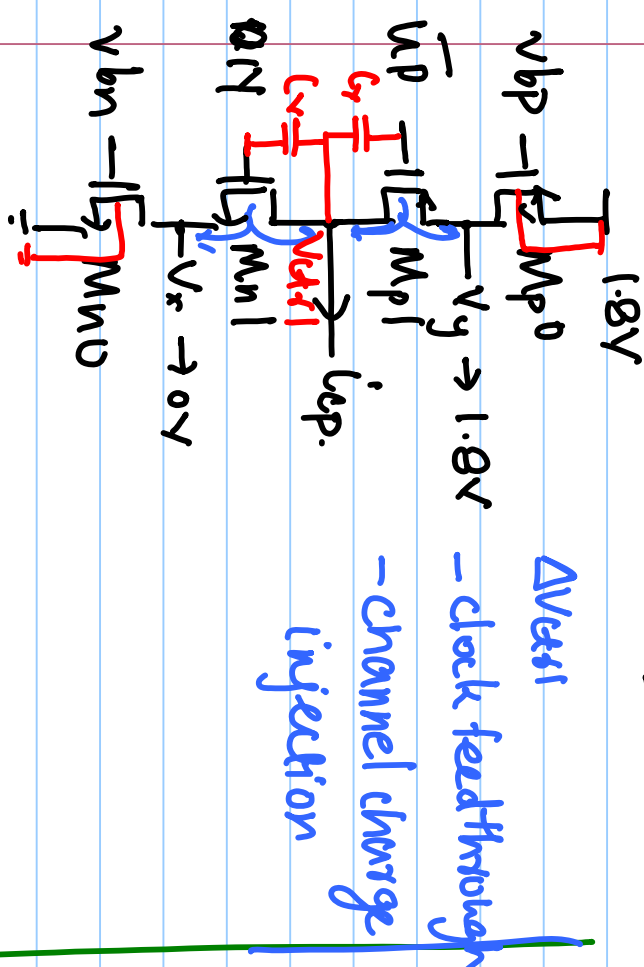
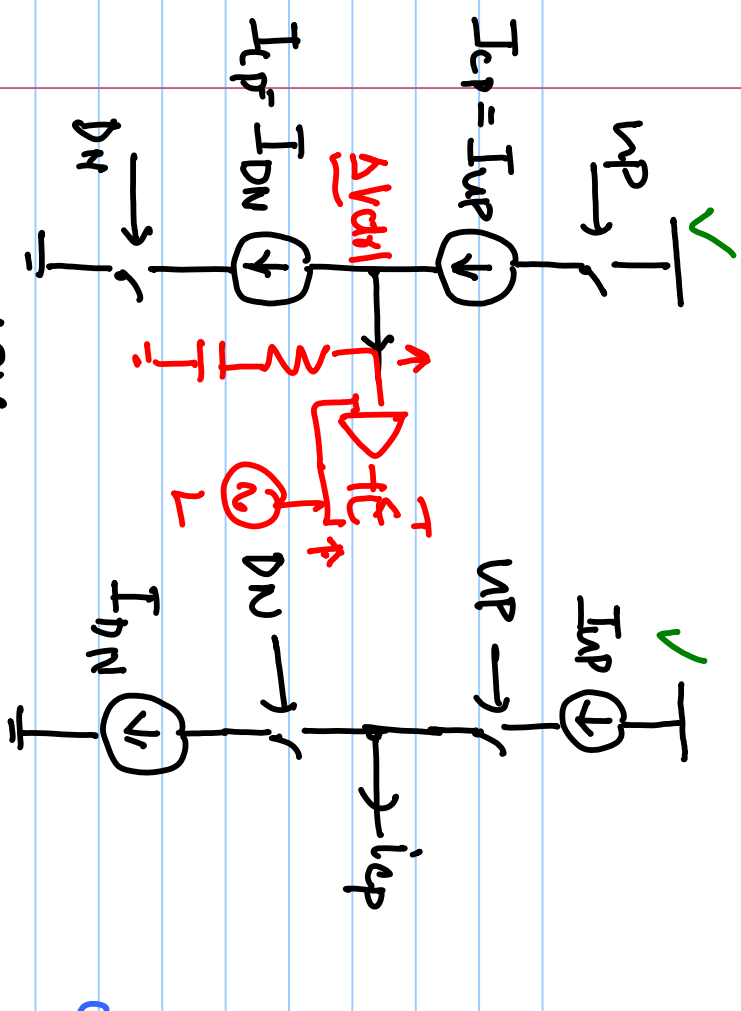
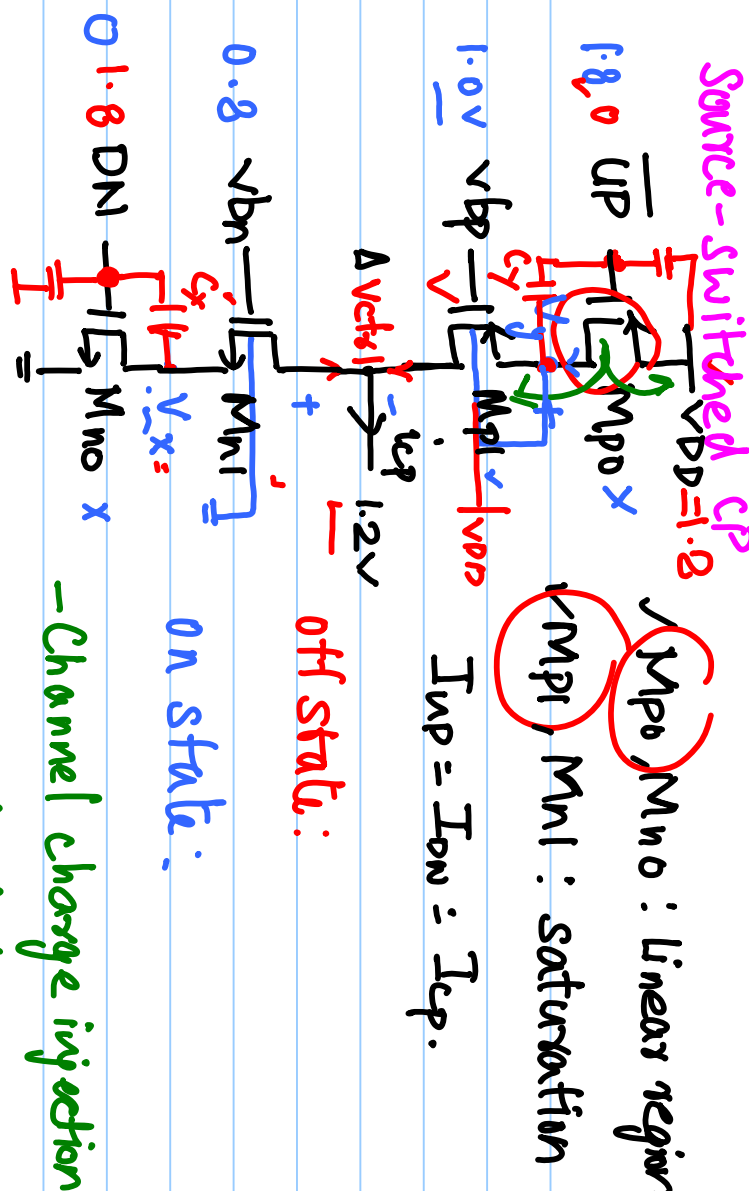


# Lecture # 39





Drain-switched CP



Source-switched CP

Fig. 0 UP

$V_{DD} = 1.8$

$M_{p0}, M_{n0}$ : linear region  
 $M_{p1}, M_{n1}$ : saturation  
 $I_{up} = I_{on} = I_{cp}$

off state:

on state:

$0.8$   $v_{bn} - v_x = 1.2v$

on state:

$0.1.8$  DN  $v_x = 1.1v$

$M_{n0}$

- Channel charge injection

- clock feed-through

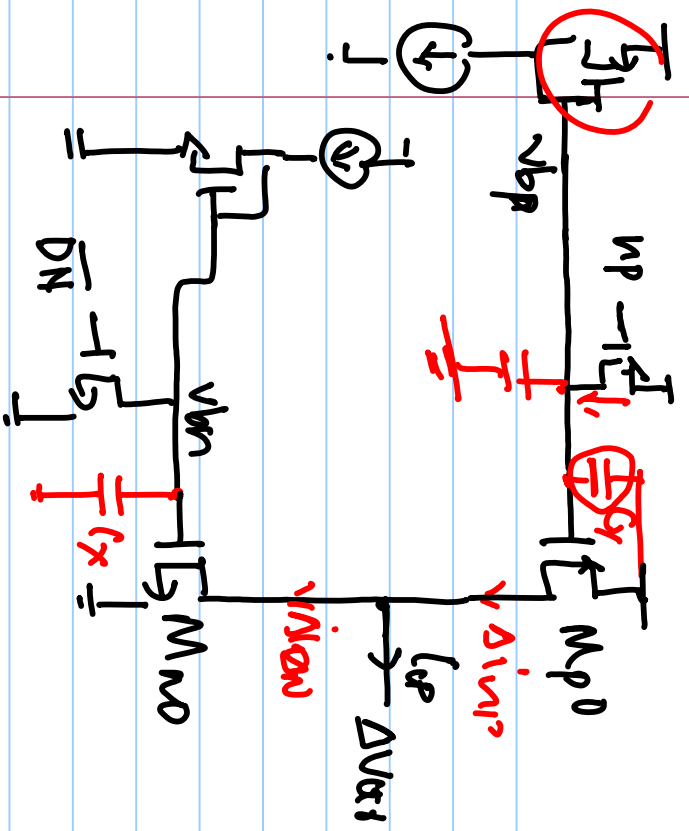
$I_{cp} = 50 \mu A$

$v_g - v_{bp} - |V_{tp}| = 0 \Rightarrow v_g = v_{bp} + |V_{tp}|$

$v_{bn} - v_x - v_{tn} = 0 \Rightarrow v_x = v_{bn} - v_{tn}$

$v_g - v_{gs1} = v_{bp} + |V_{tp}| - v_{gs1}$

$v_{gs} - |V_{tp}| = 0$



Anti-switched CP