

CND 101 - LAB [7]

MOSFET

(Metal-Oxide-Semiconductor Field -Effect Transistor)

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Section #: 16

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MOSFET CHARACTERISTICS

a. Graph 1 (I/V_{ds} Characteristic for select regions of mosfet)

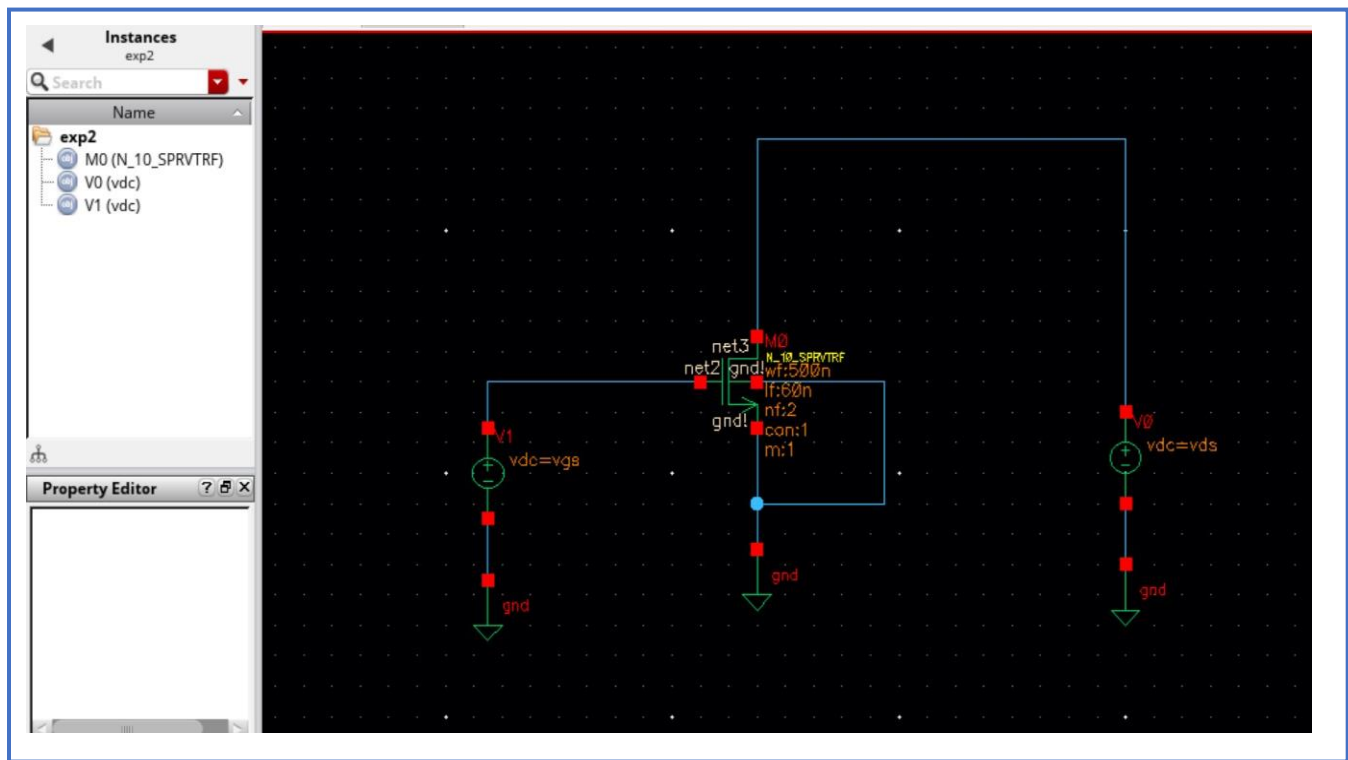


Figure 1 schematic of MOSFET with DC biasing voltage.

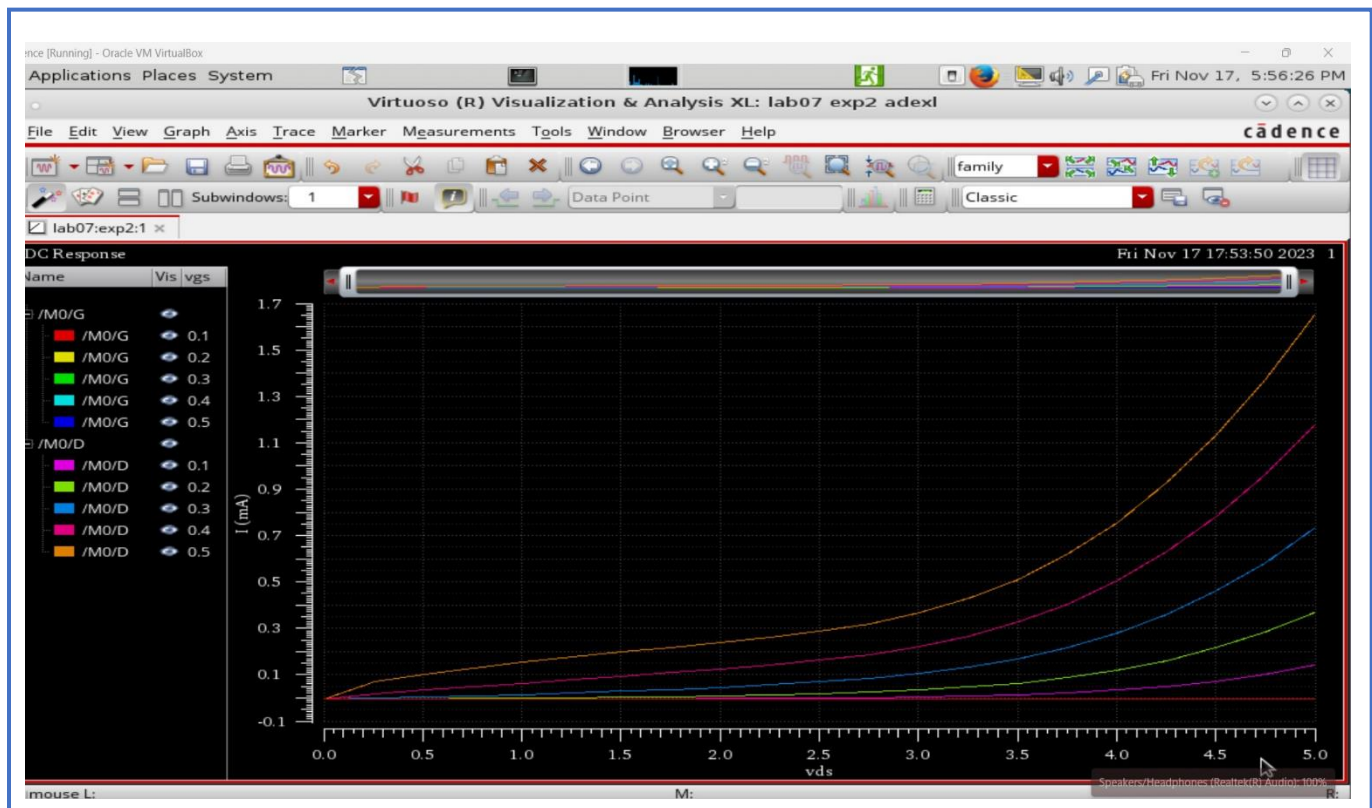


Figure 2 I/V_{DS} characteristics.

b. Graph 2 (I/V_{gs} Characteristic for select regions of mosfet)

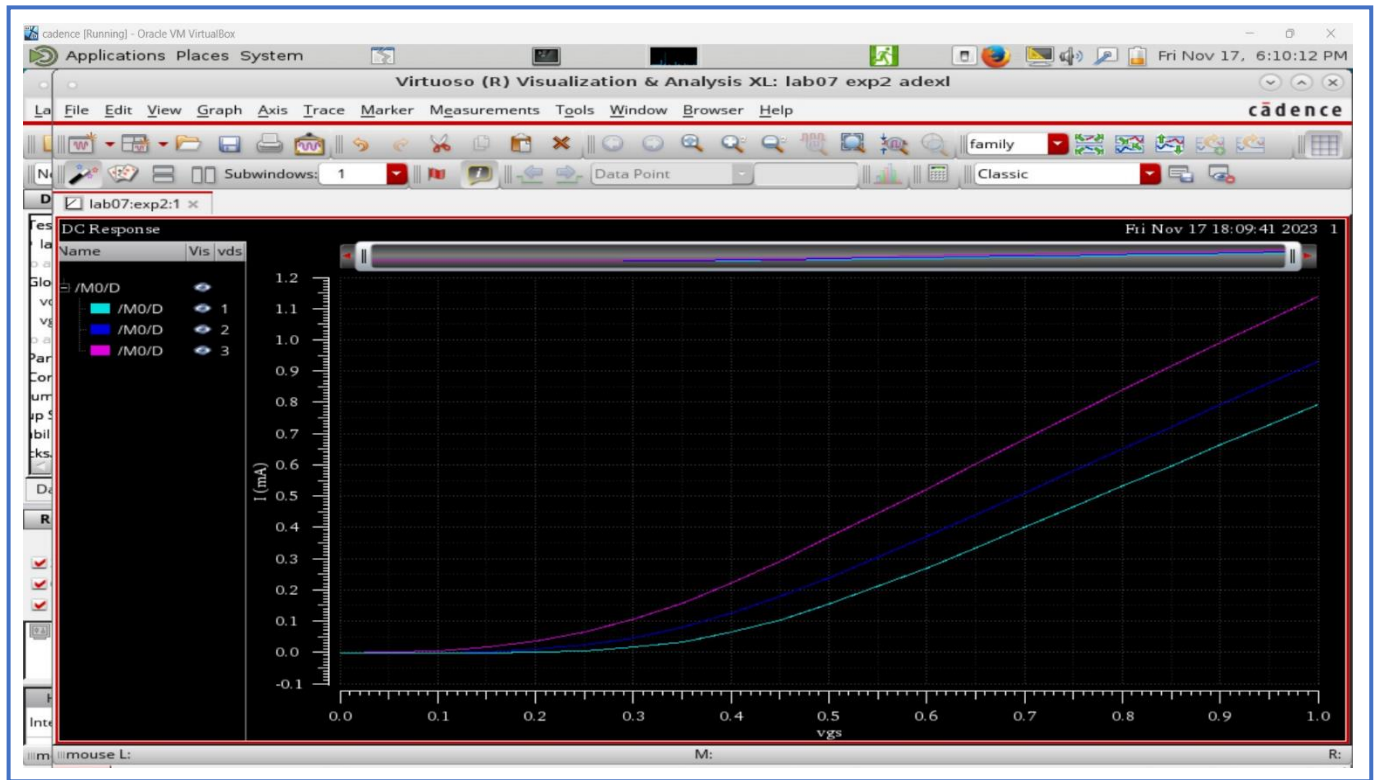


Figure 3 I/V_{GS} characteristic.

Common source amplifier

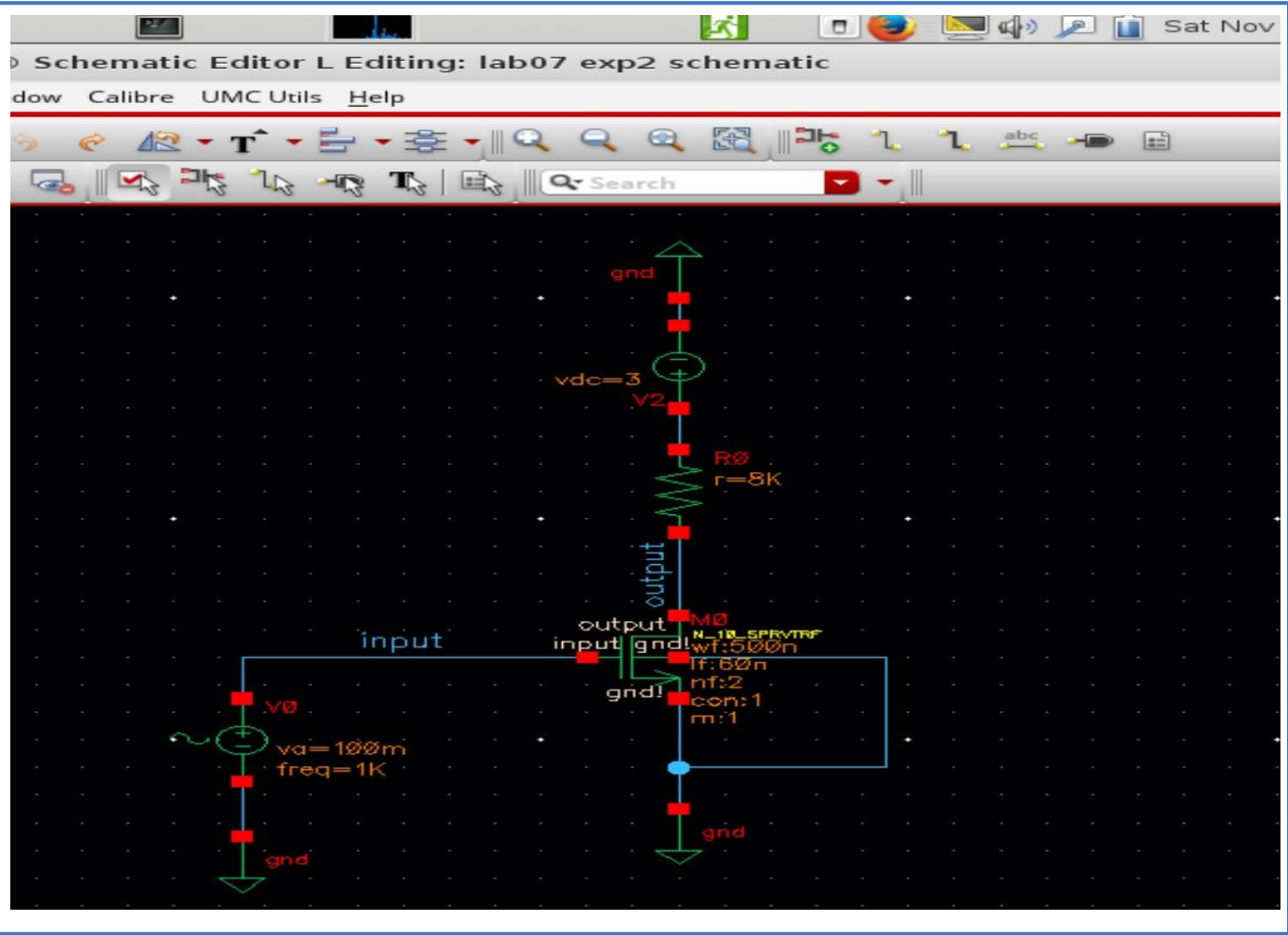


Figure 4 schematic of common source amplifier.

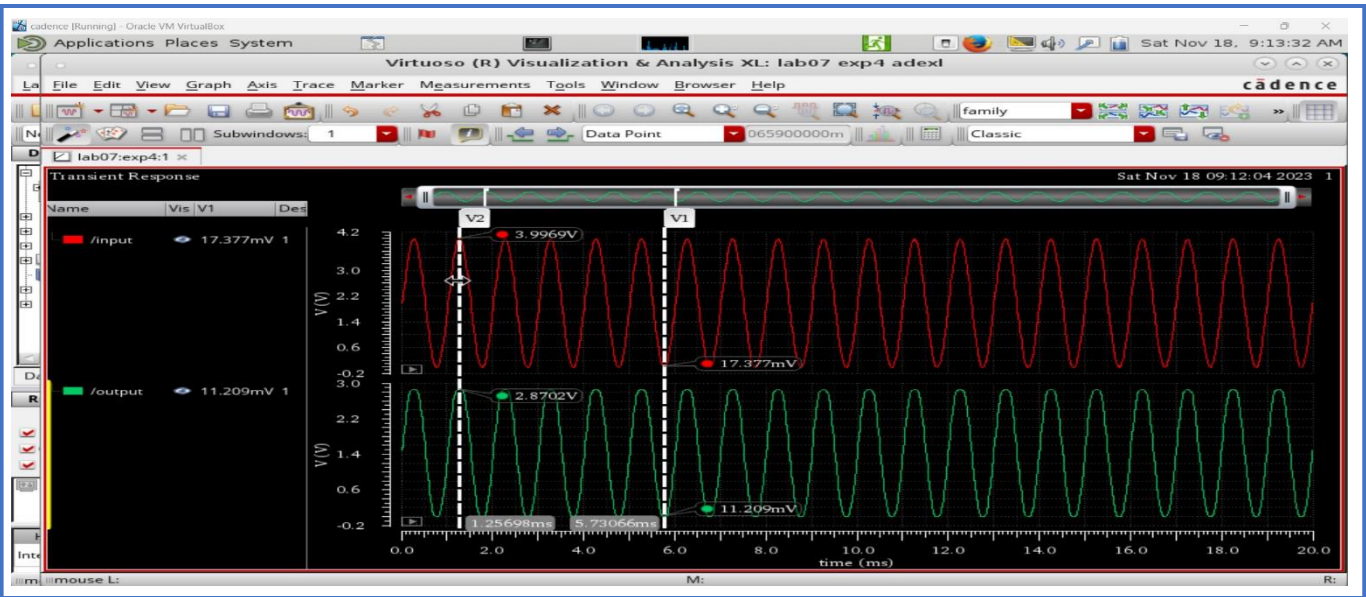
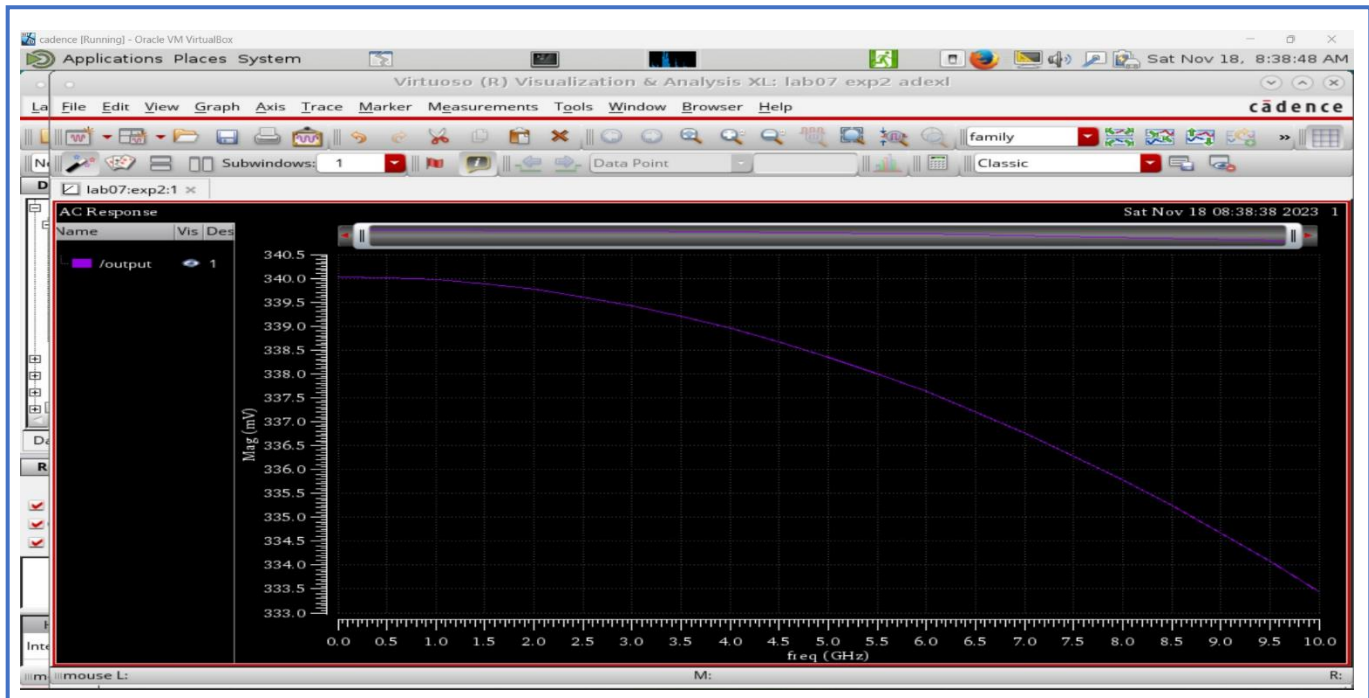


Figure 5 transient analysis of common source amplifier.



Common gate amplifier

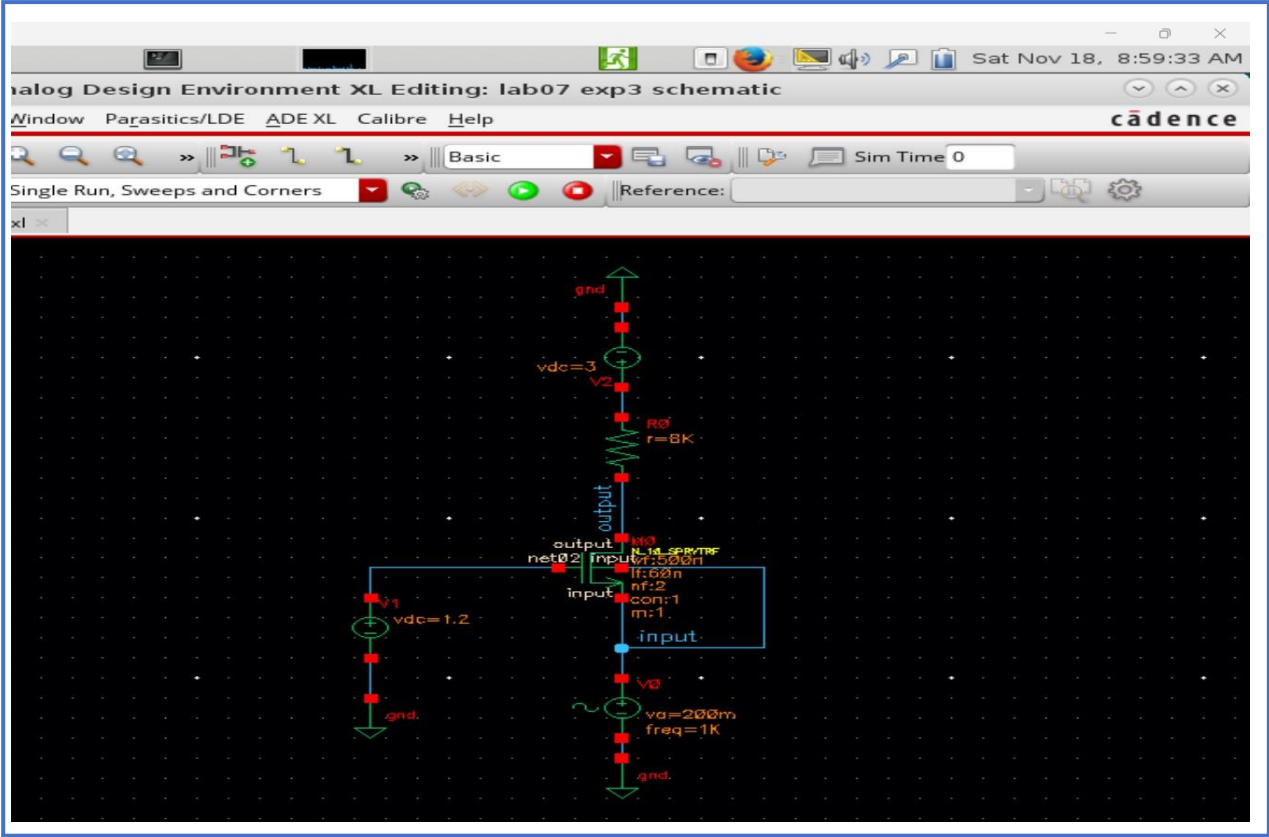


Figure 7 schematic of gate source amplifier.

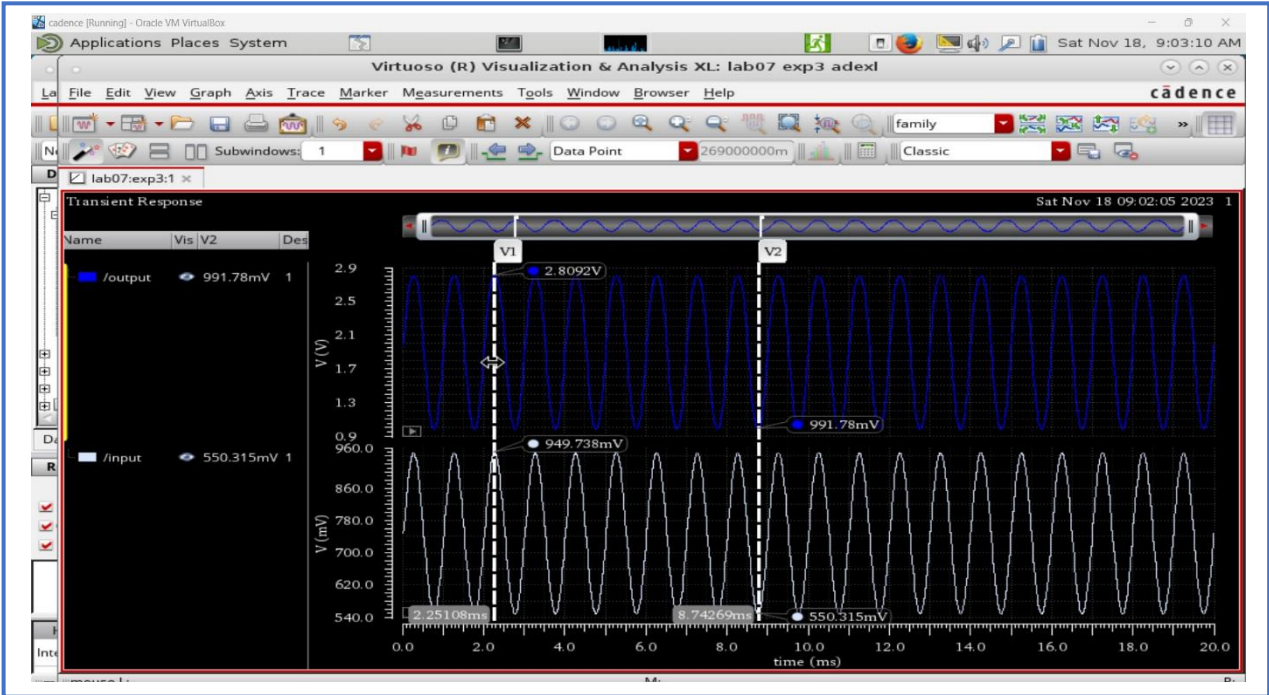
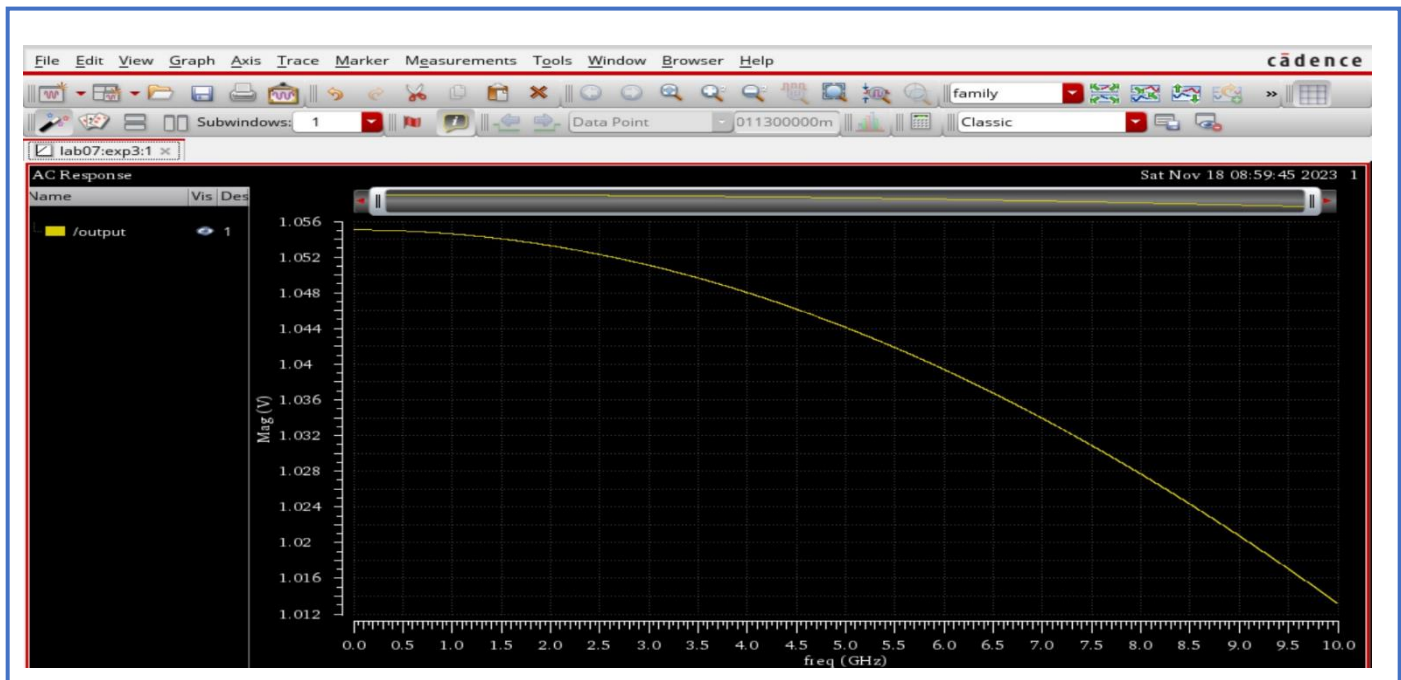


Figure 8 transient analysis of common gate amplifier.



common drain amplifier

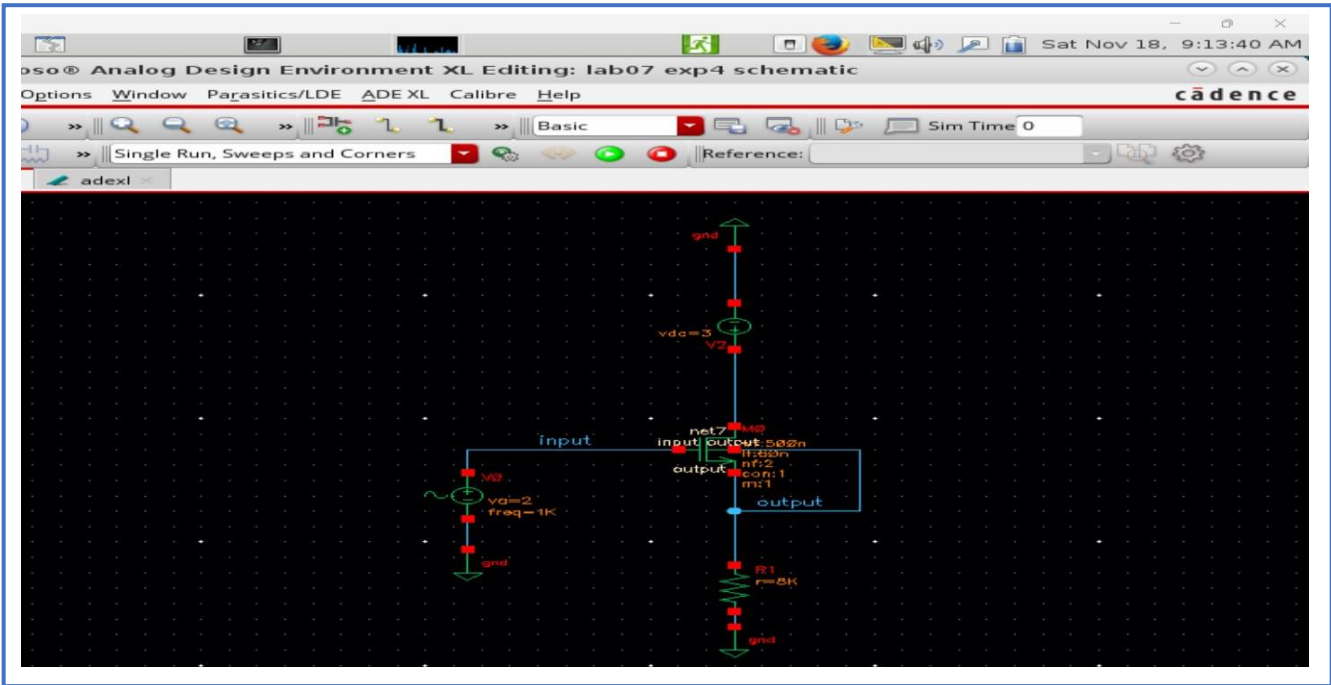


Figure 10 schematic of common drain amplifier.

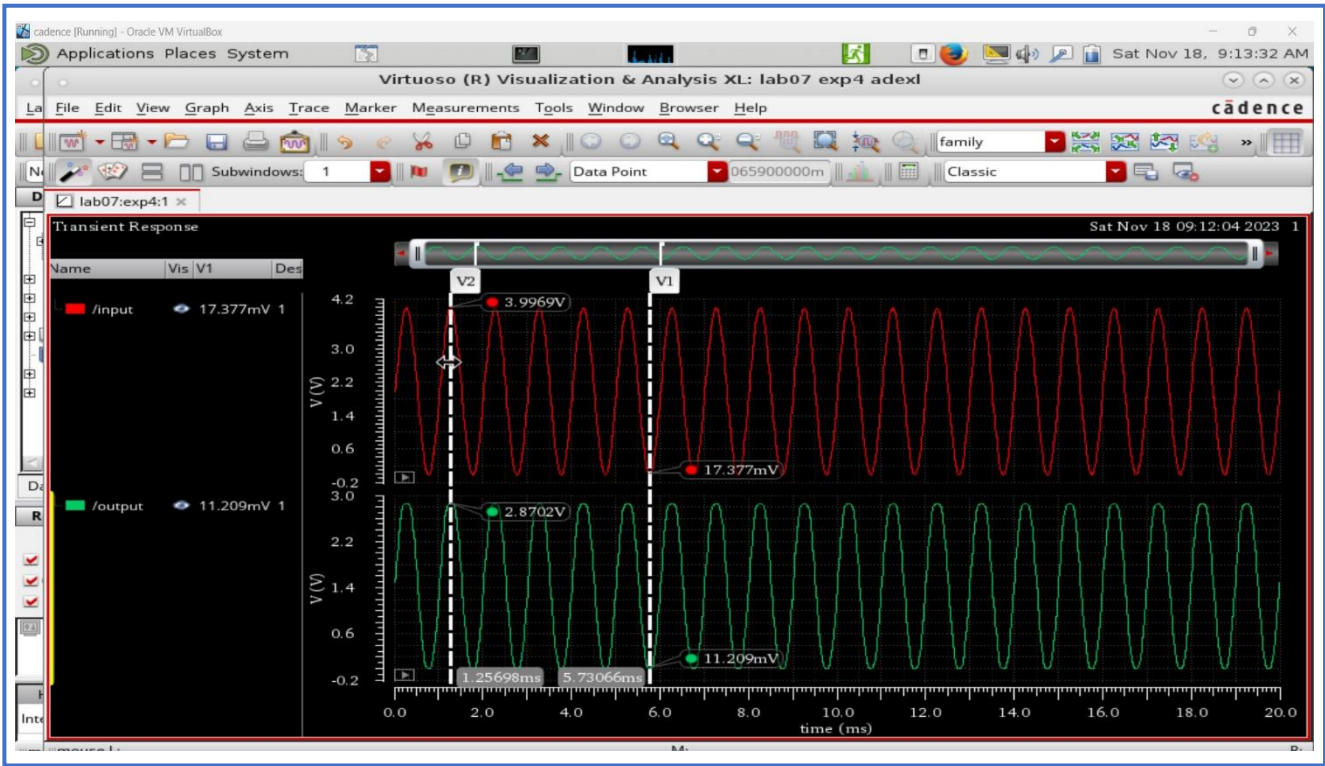
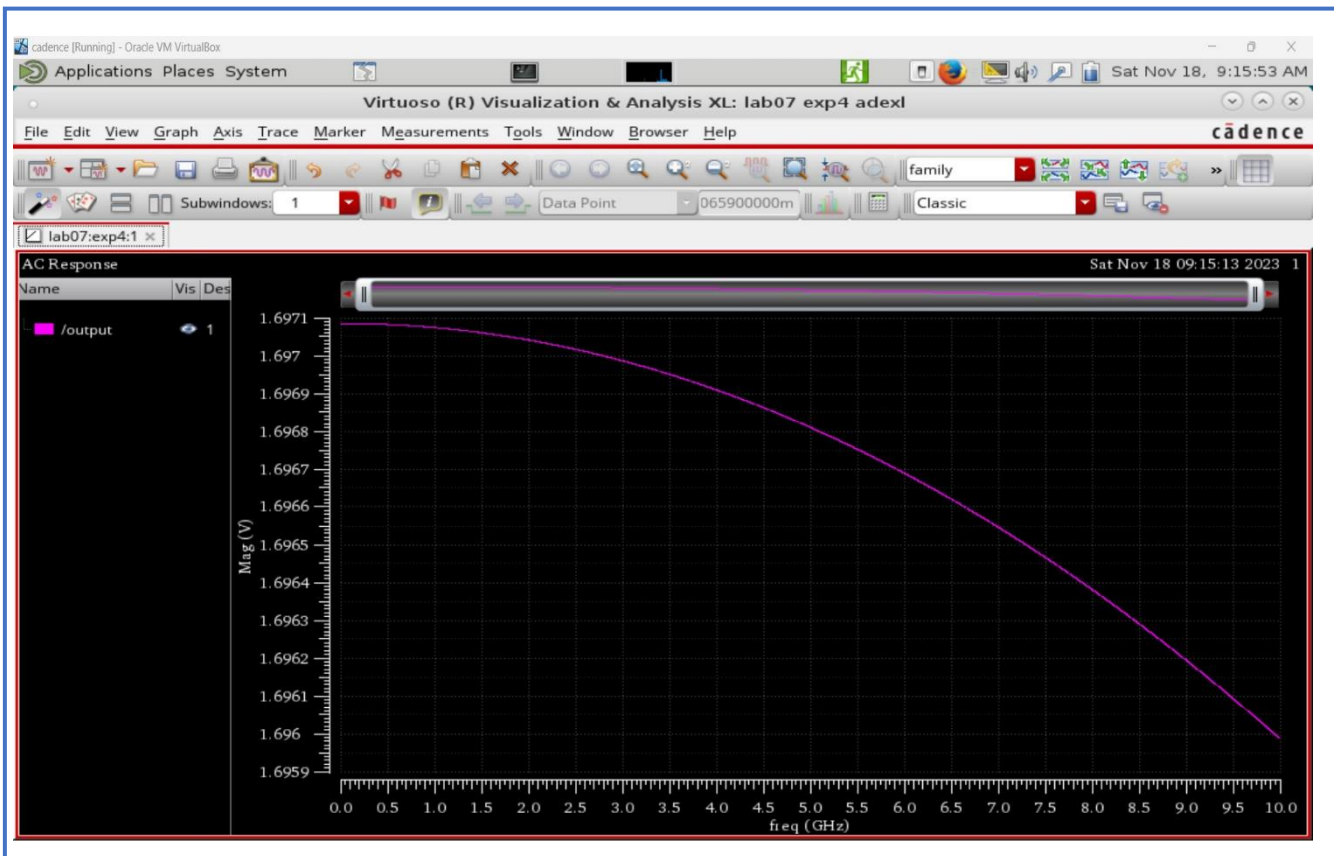


Figure 11 transient analysis of common drain amplifier.



Assignment 7

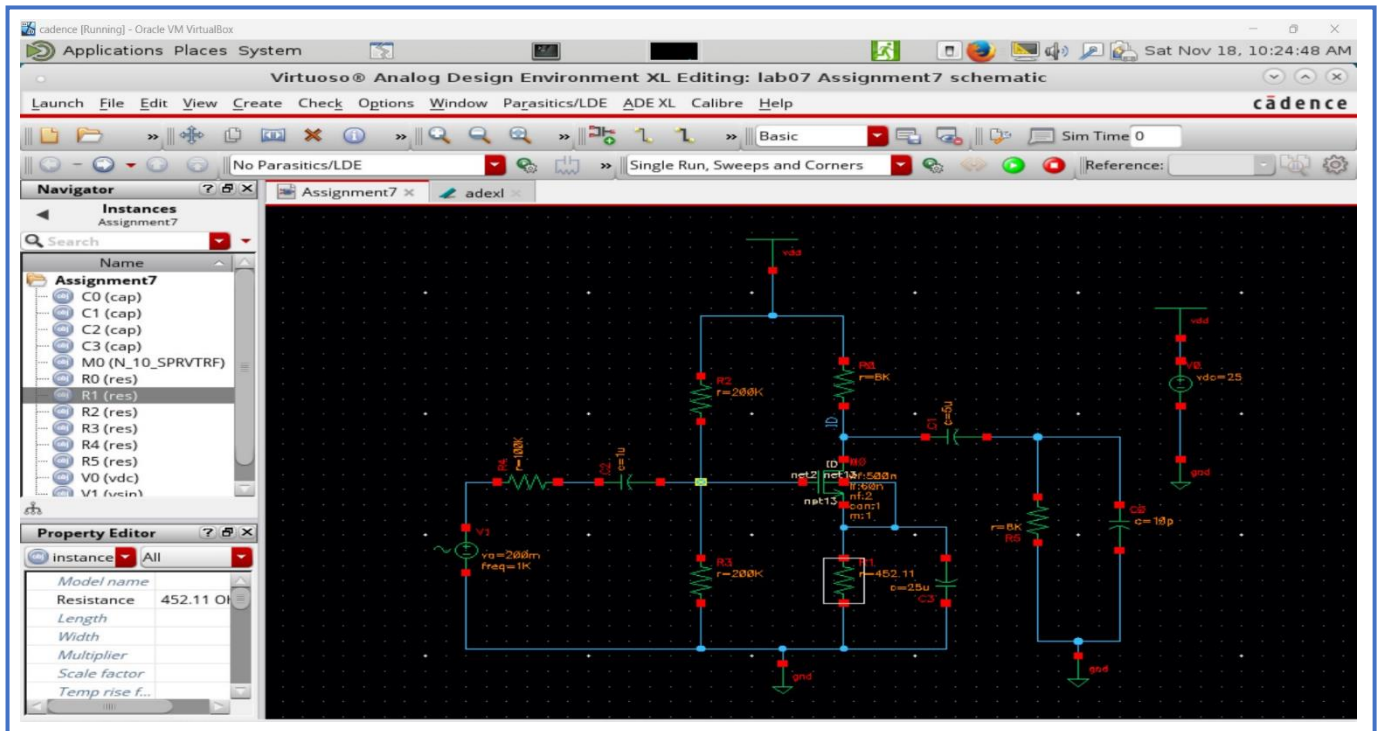


Figure 13 assignment 7 schematic (common source amplifier with capacitance to block DC signal).

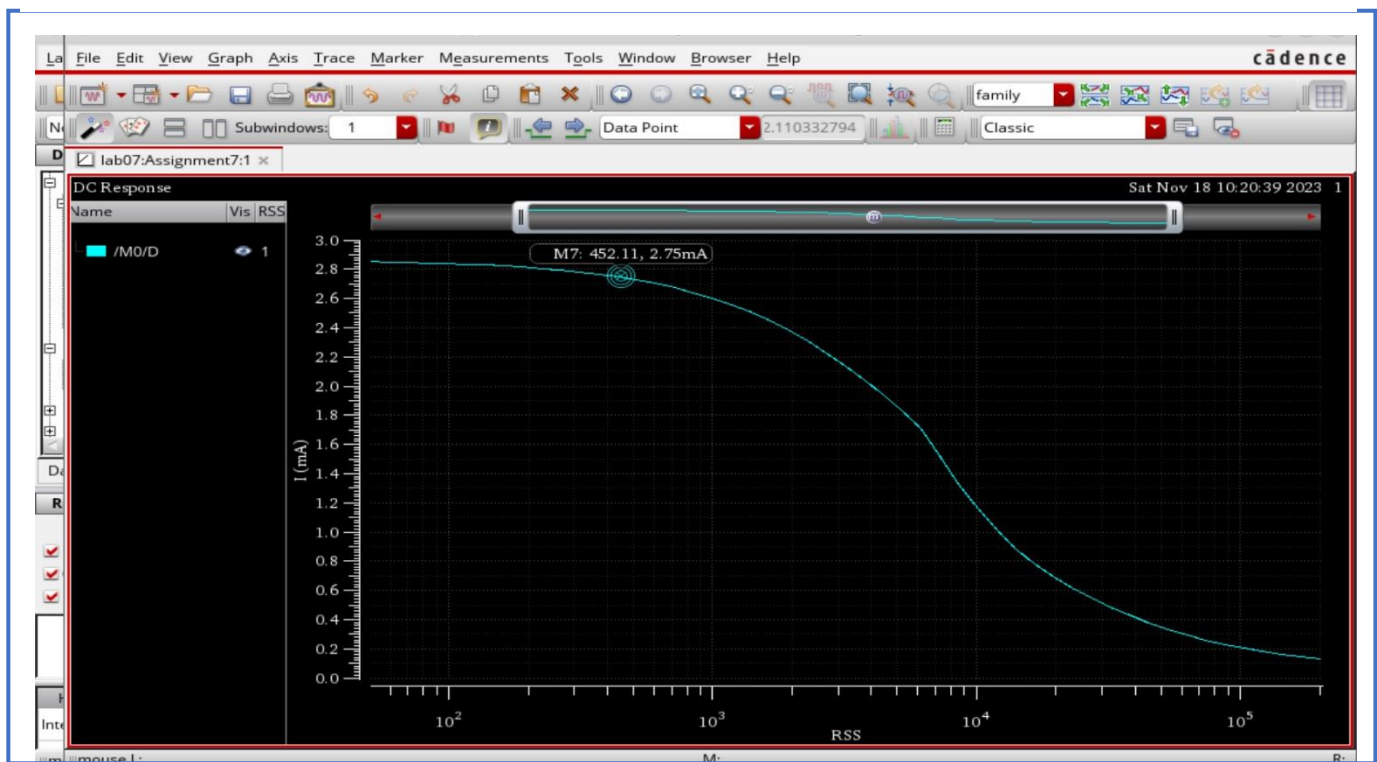
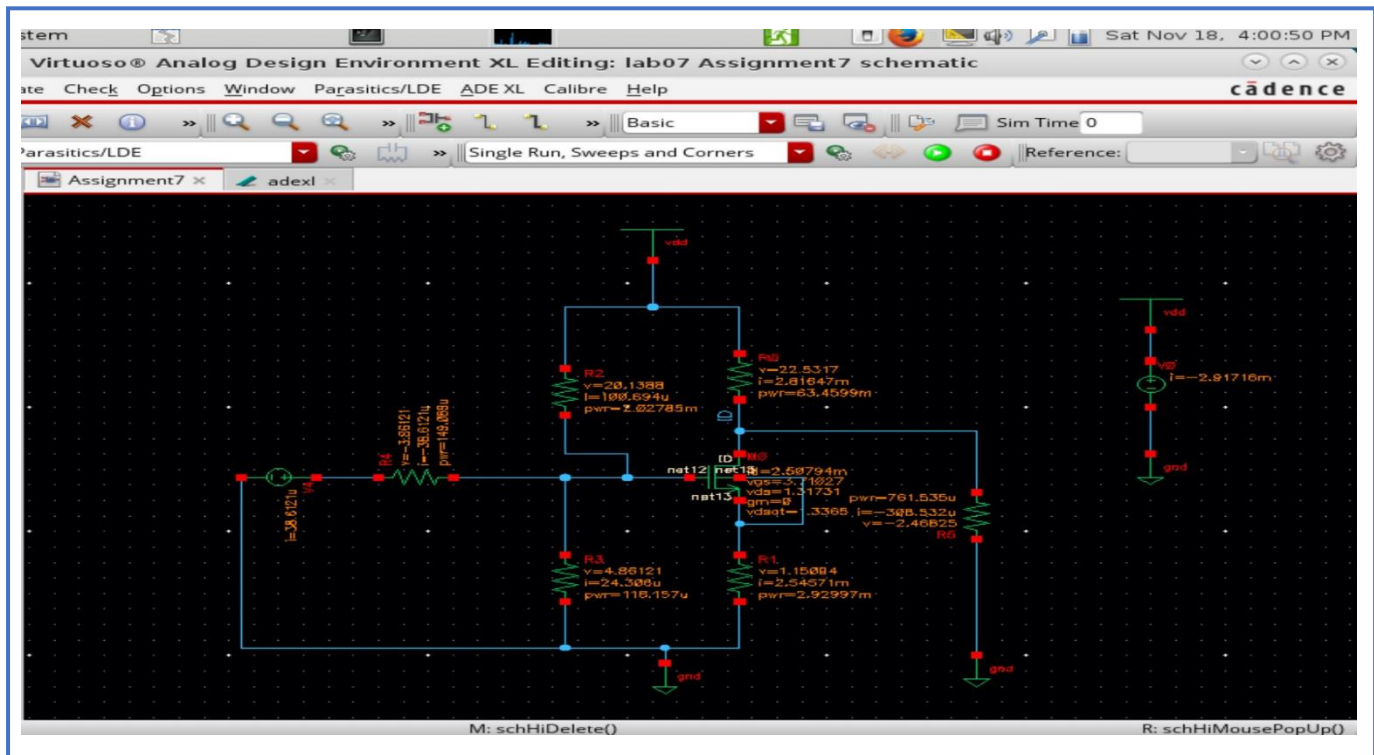


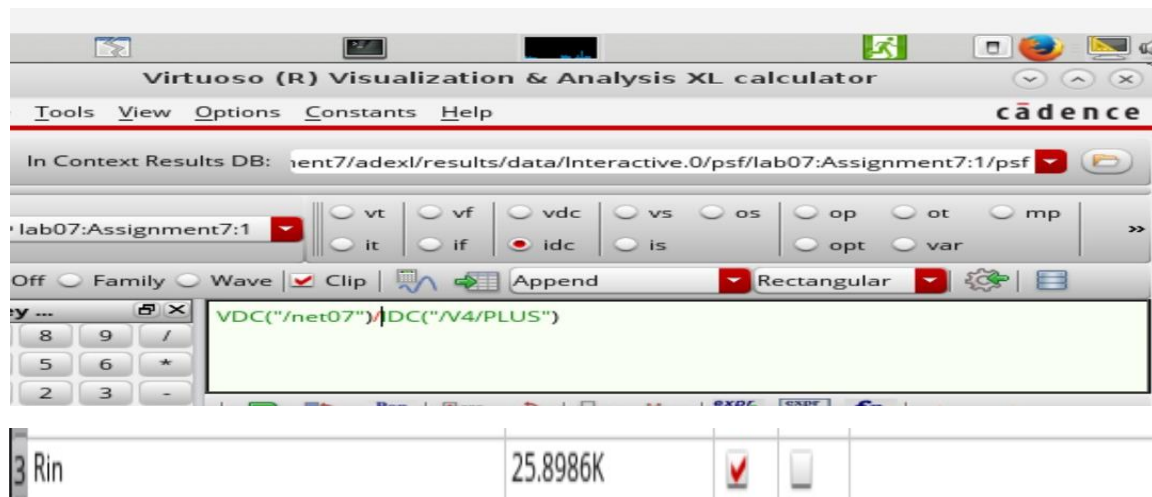
Figure 14 DC sweep analysis on RSS value

Applications Places System		Results
Window Expressions Info Help		
i	0	
pwr	0	
v	750m	
signal	OP("/M0" "??")	
beff	413.857u	
betaeff	1.91293m	
cbb	9.10557a	
cbd	-6.98828a	
cbdbo	-6.98828a	
cbg	-119.854a	
cbgbo	-119.854a	
cbs	117.737a	
cbsbo	117.737a	
cdb	-4.96803a	
cdd	528.69a	
cddbo	-7.27044a	
cdg	-655.112a	
cdgbo	-119.152a	
cds	131.39a	
cdsbo	131.39a	
cgb	3.34251a	
cgd	-510.236a	
cgdbo	25.7238a	
cgg	1.48949f	
cggbo	417.566a	
cgs	-982.596a	
cgsbo	-446.633a	
cjd	366.978a	
cjs	599.747a	
covlgb	0	
covlgd	535.96a	
covlgs	535.964a	
csb	-7.48005a	
csd	-11.4651a	
csg	-714.524a	
css	733.469a	
fug	0	
gbd	1p	
gbs	1.00001p	
gds	498.858u	
gm	0	
gm	0	
gmb	0	
gmbs	0	
gmoverid	-978.503u	
ibe	-1.20438n	
ibulk	-1.20266n	
id	2.75037m	
idb	1.71704p	
ide	2.75037m	
ids	2.77698m	
igb	1.20266n	
igbacc	1.20266n	
igbinv	1.20266n	
igcd	26.6107u	
igcs	46.0172u	
igd	2.8829n	
igdt	72.7491u	
ige	72.7491u	
igidl	0	
igisl	0	
igs	117.187n	
isb	3.70568f	
ise	-2.82312m	
isub	24.8801a	
pwr	4.7123m	
qb	-506.822a	
qbi	-506.822a	
qd	-818.409a	
qdi	-818.409a	
qg	1.67237f	
qgdovl	352.053a	
qgi	1.67237f	
qgsov1	622.85a	
qjd	-783.758a	
qjs	-2.22424a	
qs	-1.32205f	
qsi	-1.32205f	
rdeff	1.31268	
region	2	
reversed	0	
rgate	61.9844	
rgbd	108.308	

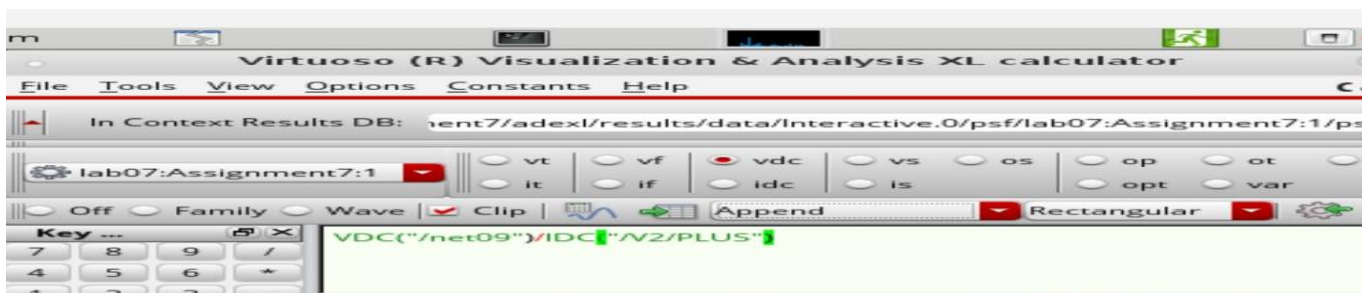
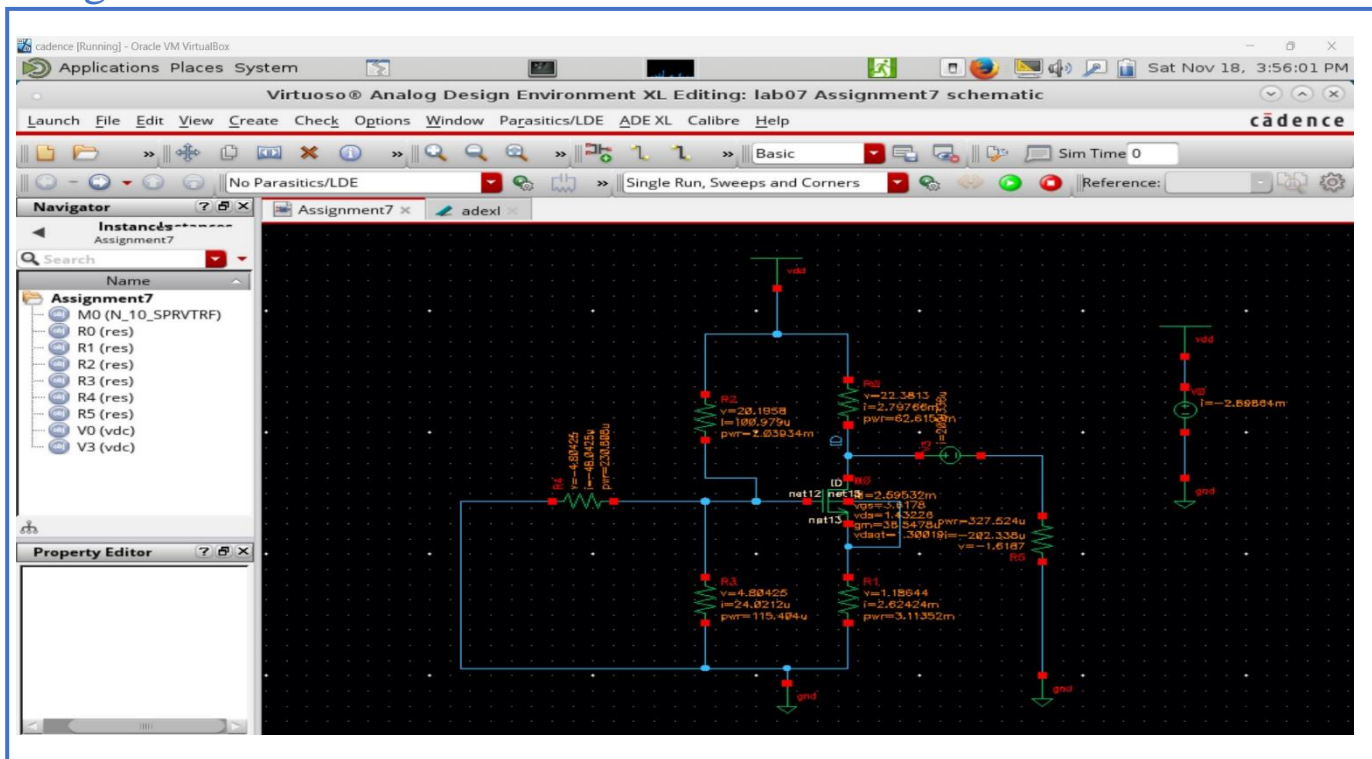
ron	619.61
rout	2.00458K
rseff	1.31268
self_gain	0
ueff	4.58045m
vbs	0
vdb	1.72065
vds	1.72065
vdsat	1.43331
vdss	1.43331
vearly	5.51334
vgb	3.94892
vgd	2.22828
vgs	3.94892
vgt	3.64574
vsat_marg	287.337m
vsb	-0
vth	303.186m

To get R_{in}





To get Rout



Outputs				
Name/Signal/Expr	Value	Plot	Save	Save C
1 Rout	12.9422K	✓	✓	