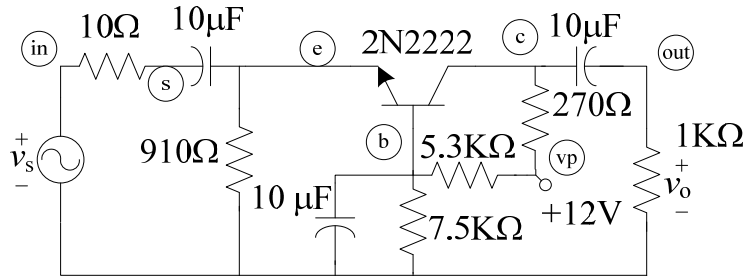# SIMULATION EXERCISES WITH SPICE – PART 3

Dr. J. E. Rayas Sánchez

Use the built-in interactive interpreter available in WinSpice to simulate $n$ times the magnitude of the AC voltage gain $|v_o/v_s|$ and the transient output voltage $v_o(t)$ for the following Common Base amplifier, with $R_S = n10\Omega$, with $n = 1, 2, …, 5$. For the transient analysis, assume that $v_s$ is a sinusoidal voltage with 250mV of amplitude and 1KHz of frequency.



```
Common Base Amplifier
* ------------------------------------------------------
* Dr. J.E. Rayas-Sanchez              February 28, 2016
* ------------------------------------------------------
* Common Base Amplifier Using the Interactive Interpreter

Vs    in   0    DC 0V    AC 1V    SIN(0 250mV 1KHz)
Vcc   vp   0    DC 12V
Q1    c    b    e    Q2N2222
RS    in   s    10
RE    e    0    910
RC    c    vp   270
R1    b    vp   5.3K
R2    b    0    7.5K
RL    out  0    1K
CE    e    s    10uF
CB    b    0    10uF
CL    c    out  10uF
.MODEL Q2N2222 NPN
+(IS=3.108E-15 XTI=3 EG=1.11 VAF=131.5 BF=217.5
+ NE=1.541 ISE=190.7E-15 IKF=1.296 XTB=1.5 BR=6.18
+ NC=2 ISC=0 IKR=0 RC=1 CJC=14.57E-12 VJC=.75
+ MJC=.3333 FC=.5 CJE=26.08E-12 VJE=.75 MJE=.3333
+ TR=51.35E-9 TF=451E-12 ITF=.1 VTF=10 XTF=2)

.control
destroy all
let count = 0
    while count < 5
      alter RS = 10 + 10*count
      AC DEC 10 10Hz 900MEGHz
      TRAN 5us 5ms
      let count = count + 1
    end
plot db(ac1.v(out)) db(ac2.v(out)) db(ac3.v(out))
+    db(ac4.v(out)) db(ac5.v(out))
plot tran1.v(out) tran2.v(out) tran3.v(out)
+    tran4.v(out) tran5.v(out)
.endc
.end
```