Auto-generated SPICE netlist

```
* Qucs 0.0.19  /home/vvk/.qucs/tunn-Bsrc.sch
.PARAM kB = 1.38e-23
.PARAM q = 1.6e-19
.PARAM Vv = 0.4
.PARAM Iv = 1e-6
.PARAM Ip = 1e-5
.PARAM Is = 1e-12
.PARAM Vp = 0.1
.PARAM K = 5
.PARAM Temp0 = 300
.PARAM phiT = {(kB*Temp0)/q}
VPr1 _net0 anode DC 0 AC 0
V1 _net0 0 DC 1
B1 anode 0 I = Is*(exp(V(anode)/phiT)-1.0)+
+ Iv*exp(K*(V(anode)-Vv))+
+ Ip*(V(anode)/Vp)*exp((Vp-V(anode))/Vp)
.control
set filetype=ascii
echo "" > spice4qucs.cir.noise
DC V1 -0.05 0.4 0.009
write tunn-Bsrc_dc.txt VPr1#branch v(anode)
destroy all
reset

exit
.endc
.END
```
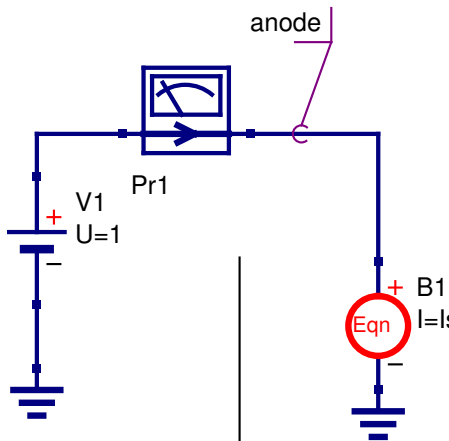
Parameter sweep

SW1
Sim=DC1
Type=lin
Param=V1
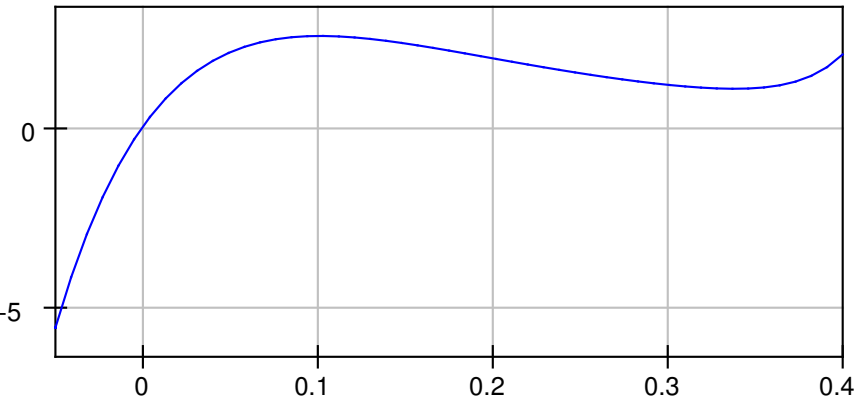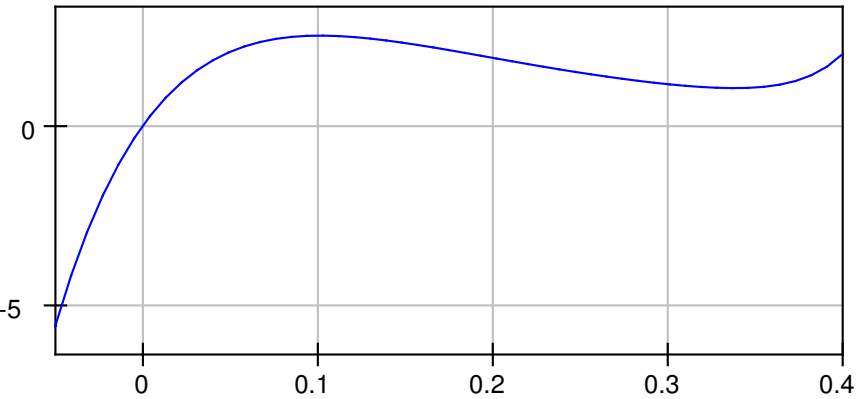Start=-0.05
Stop=0.4
Points=50

dc simulation

DC1

.PARAM

SpicePar1
kB=1.38e-23
q=1.6e-19
Vv=0.4
Iv=1e-6
Ip=1e-5
Is=1e-12
Vp=0.1
K=5
Temp0=300
phiT={(kB*Temp0)/q}

anode

Pr1

V1
U=1

B1
I=Is*(exp(V(anode)/phiT)-1.0)+Iv*exp(K*(V(anode)-Vv))+Ip*(V(anode)/Vp)*exp((Vp-V(anode))/Vp)

Eqn