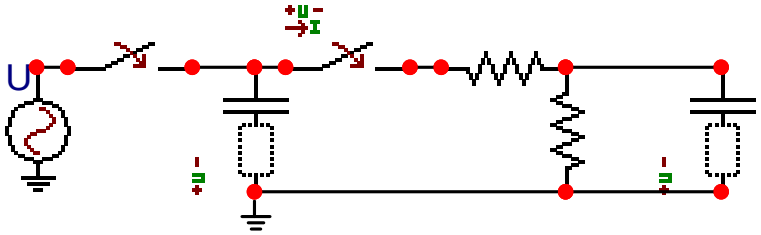
Problem 2.8.

C1 has been charged to 500kV
The gap sparks and generates an impulse voltage at A-B.

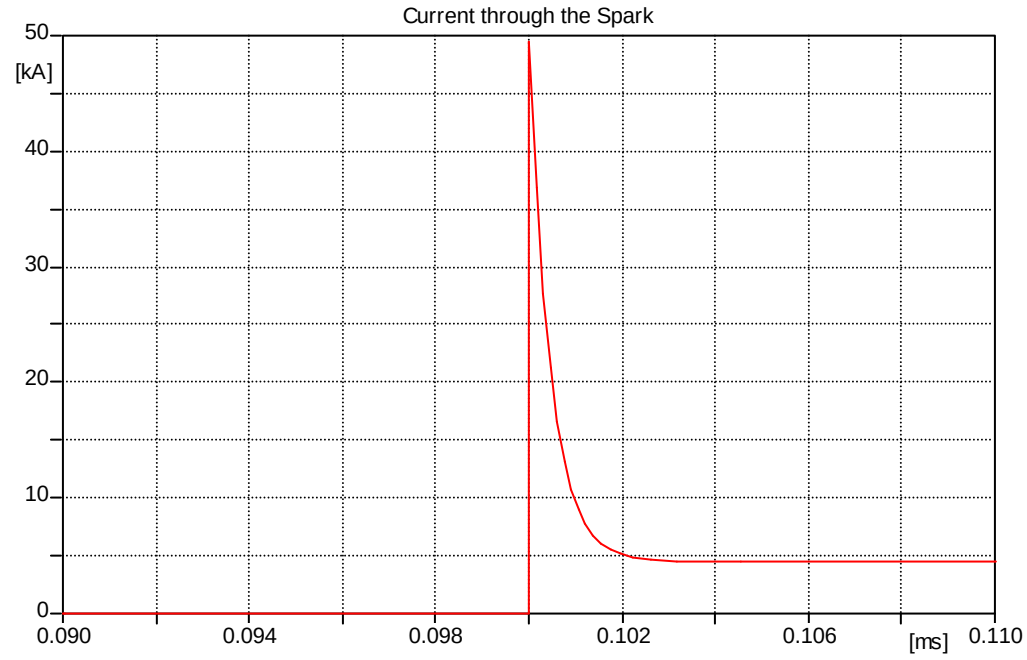
C1=2uF, C2=0.05uF
R1=10ohm, R2=100ohm

Maximum spark current= 50kA
Maximum voltage across C2= 454kV in about 2us(4 time constants)
At 0.5us voltage is close to 453.95kV
At 50us voltage is close to 453.64kV

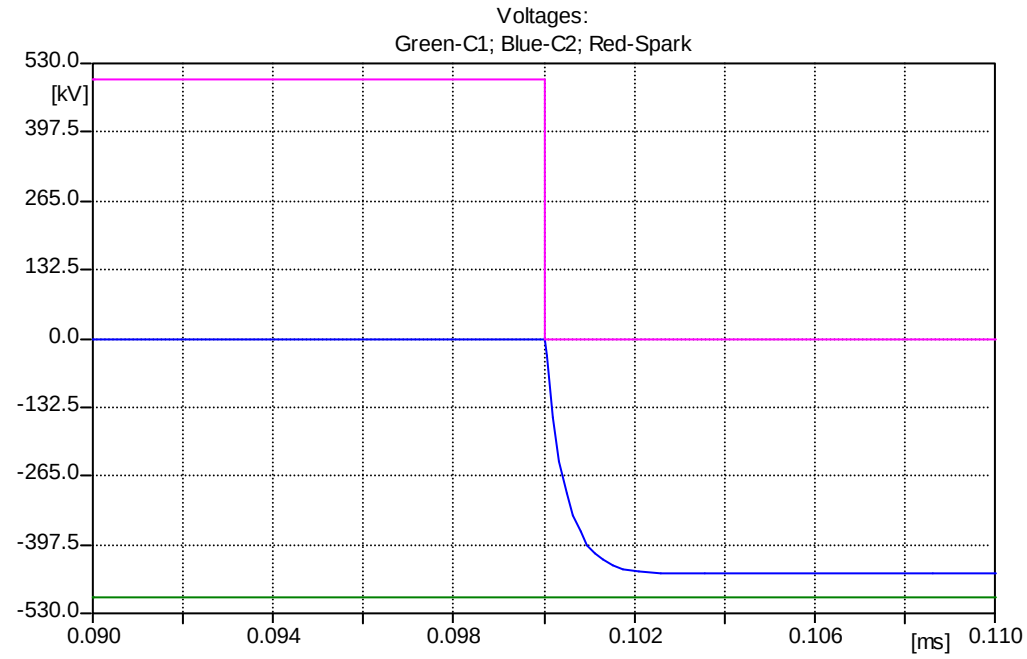
For simulation we have to first charge C1 to 500kV and then switch the source off at the same time the gap sparks-over. This can be done in an unsophisticated approach by simulating the spark as an ideal switch. The circuit in ATP becomes:



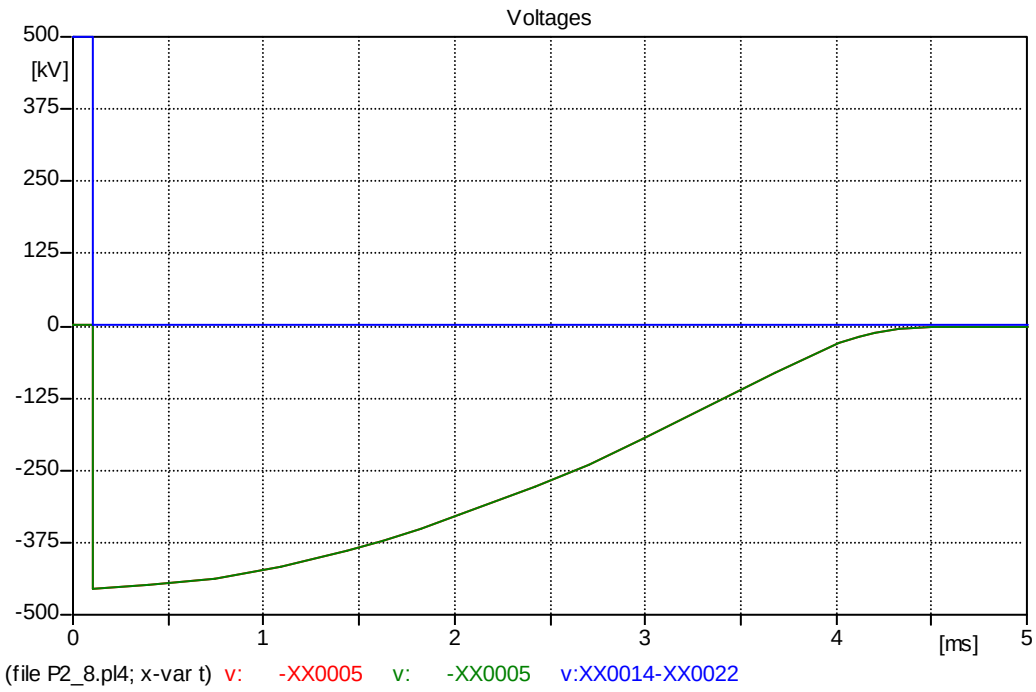
The results are shown on the next page.



(file P2_8.pl4; x-var t) c:XX0012-XX0020



(file P2_8.pl4; x-var t) v: -XX0012 v: -XX0005 v:XX0012-XX0020



This is the result at time equals infinity in the simulated circuit. The voltage will drop down to zero since there is no forcing function to re-energize the circuit.