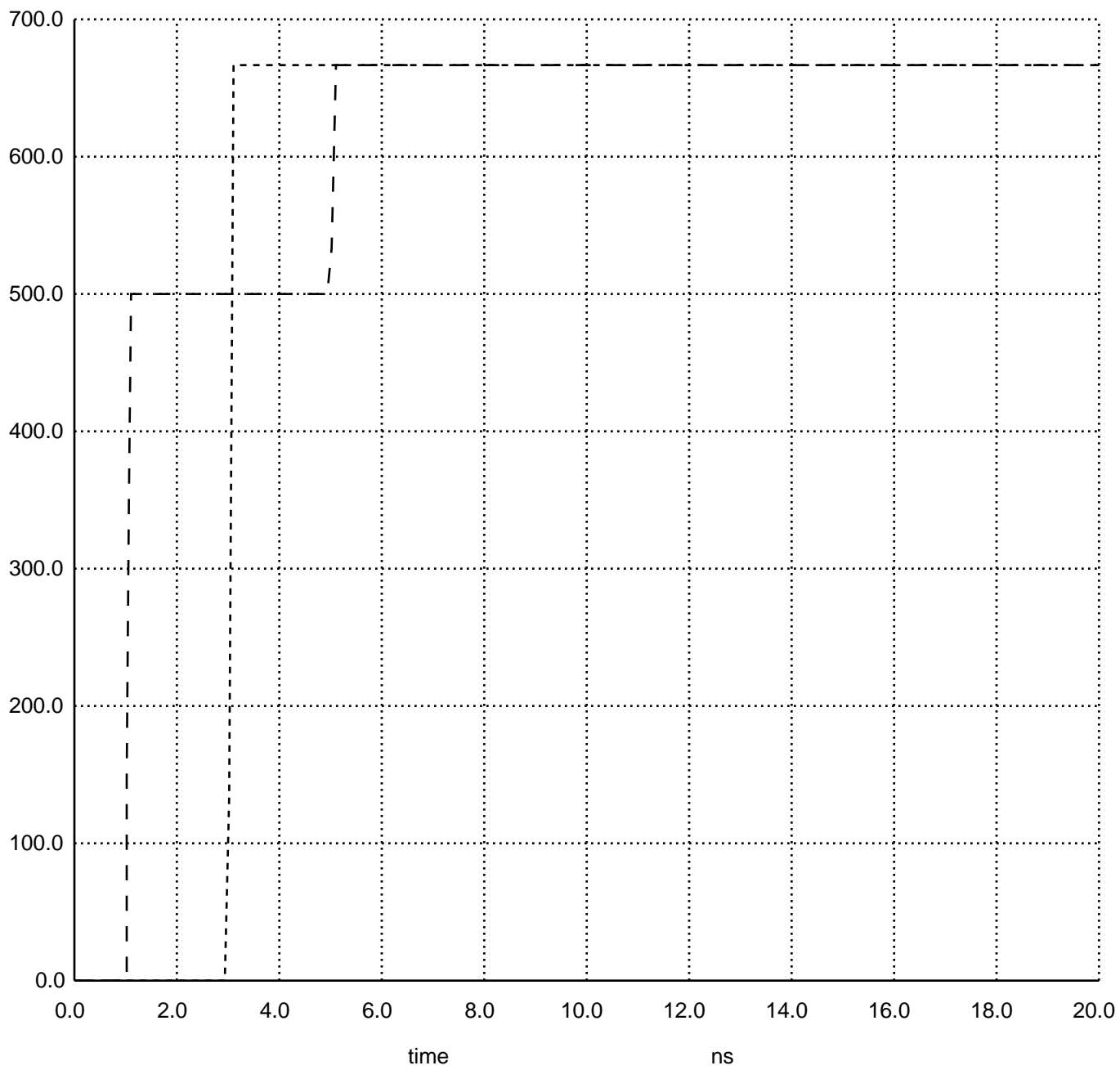
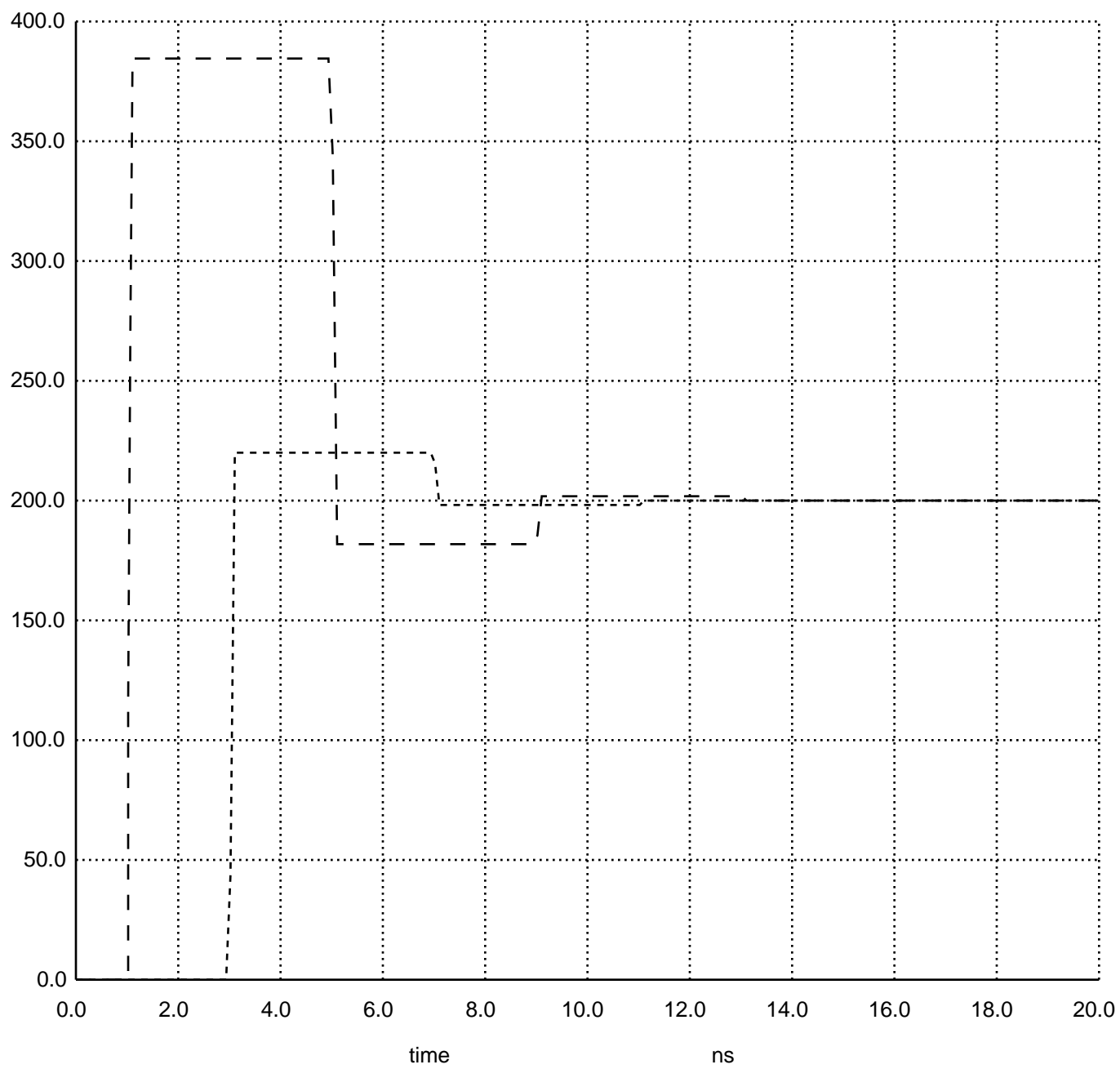


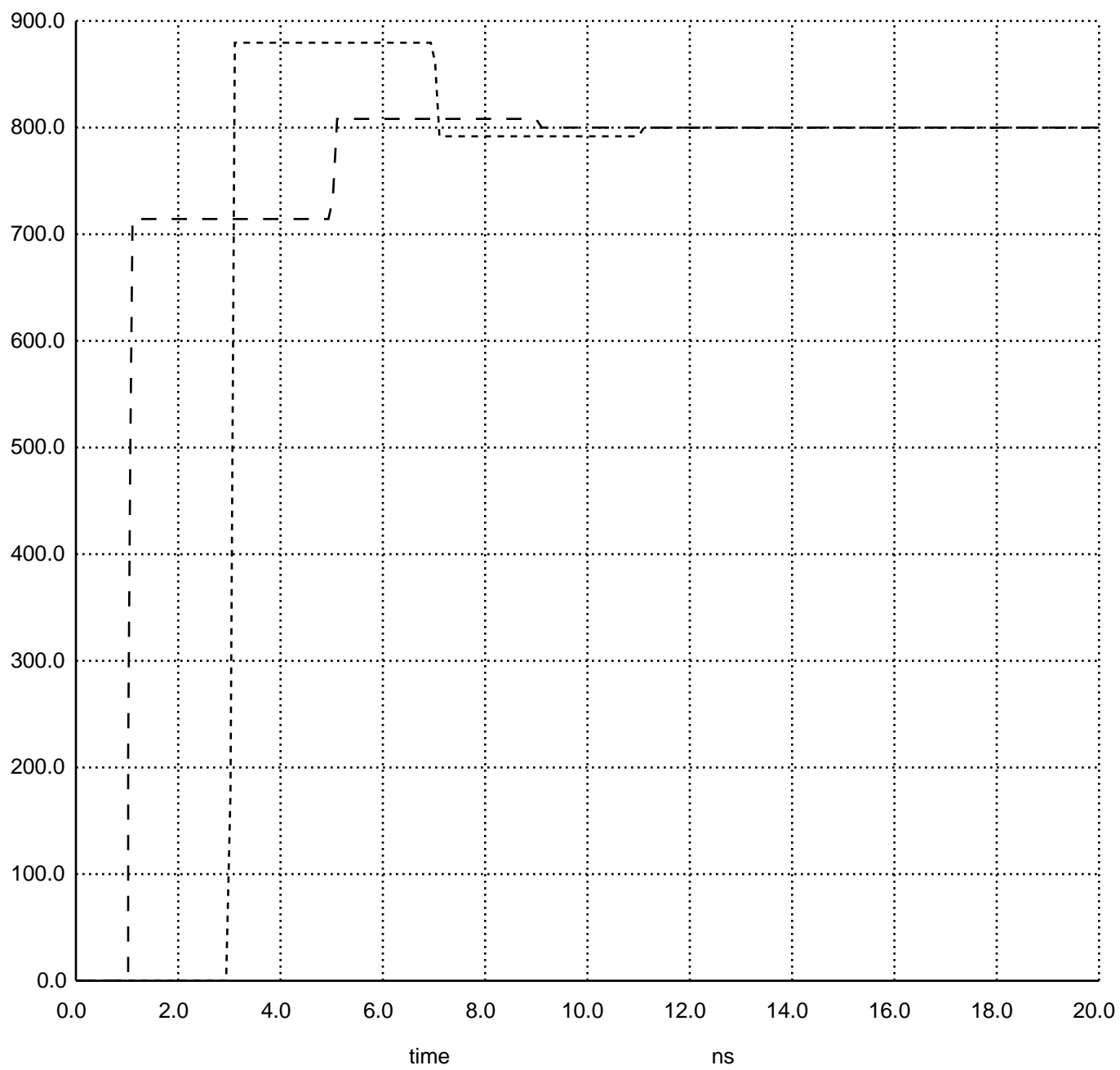
mV      - - - - v(tline\_output)                      - - - v(tline\_input)



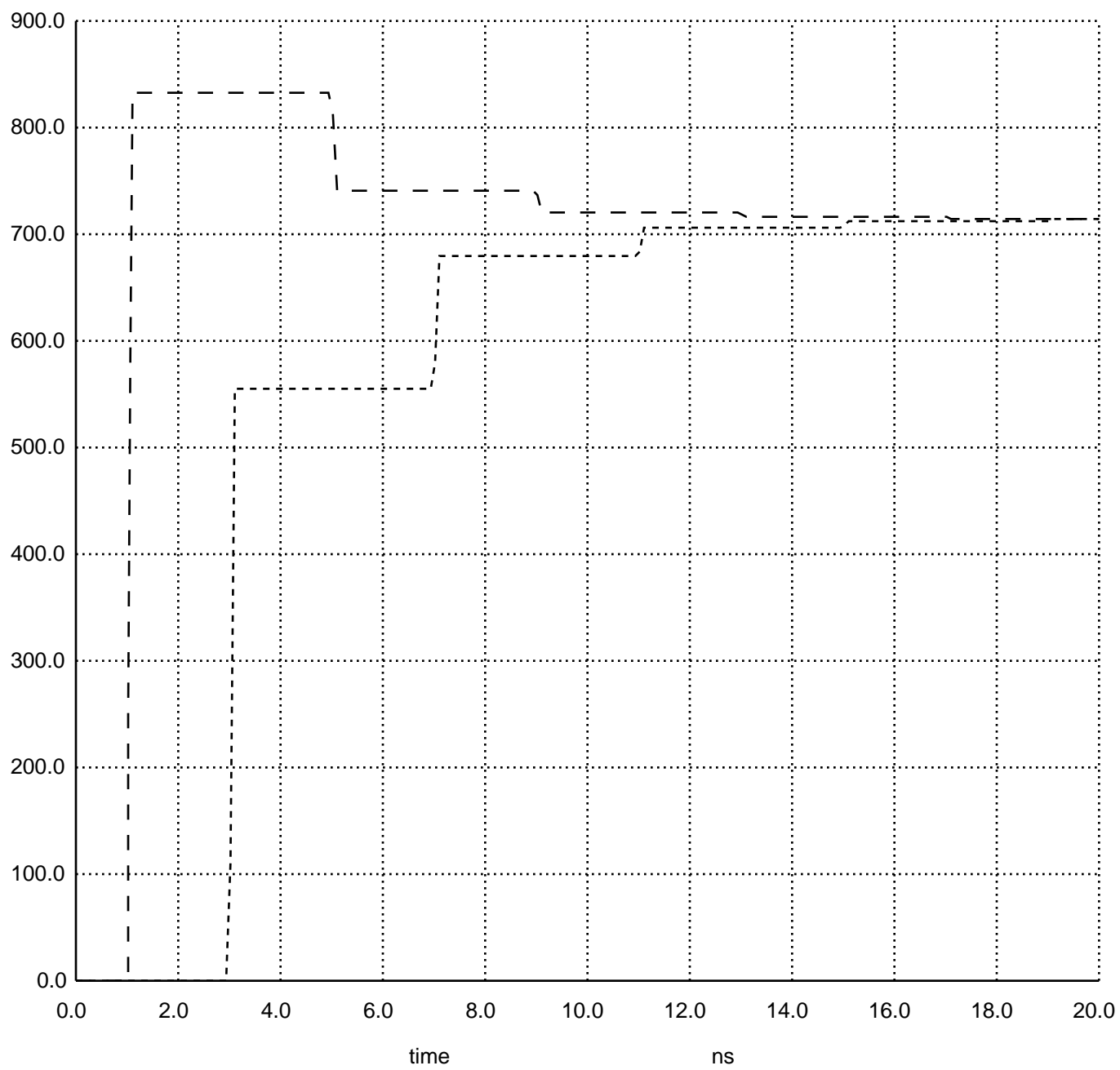
mV      - - - - v(tline\_output)      - - - v(tline\_input)



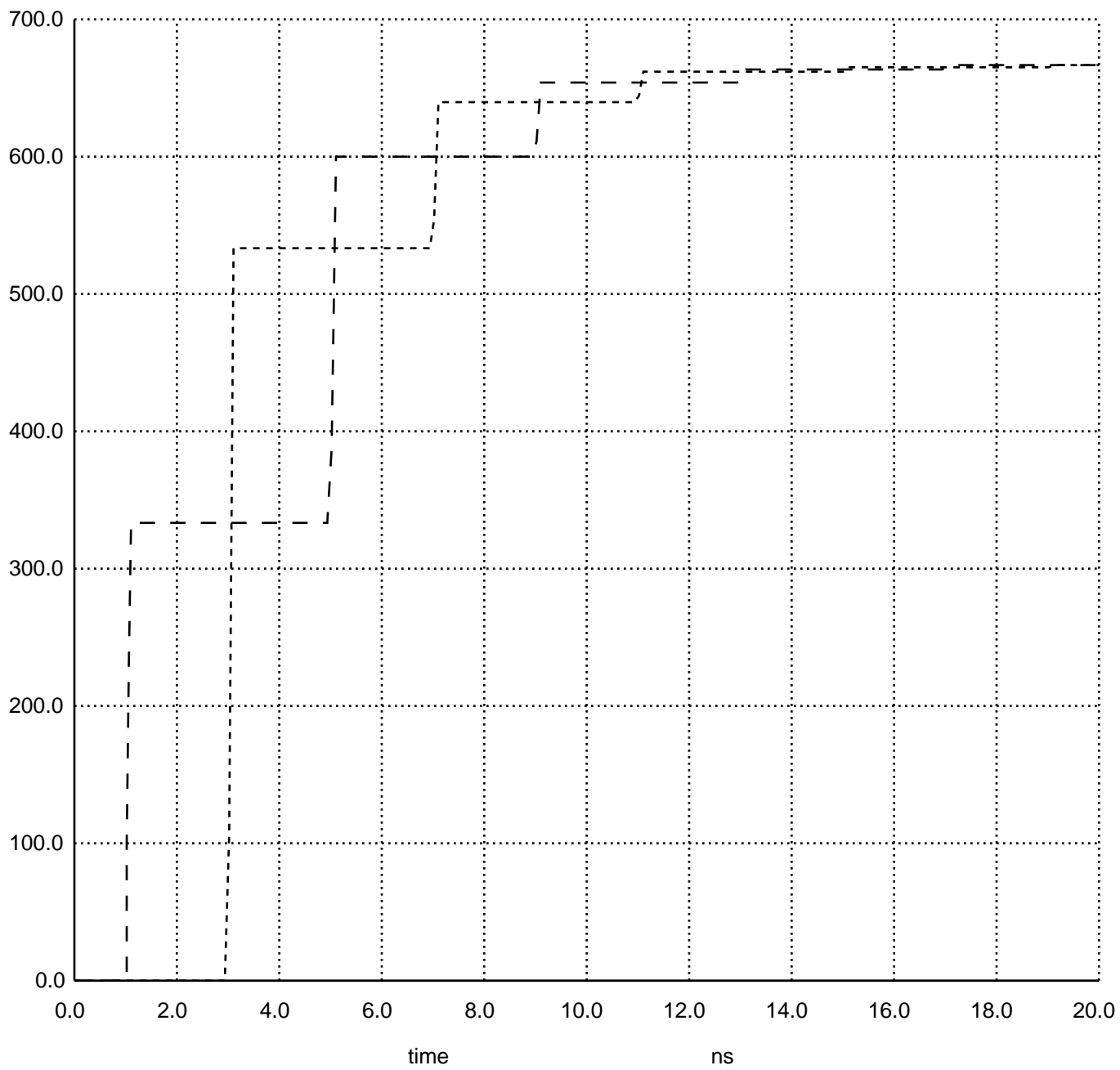
mV      - - - - v(tline\_output)                      - - - v(tline\_input)



mV      - - - - v(tline\_output)      - - - v(tline\_input)



mV      - - - - v(tline\_output)      - - - - v(tline\_input)



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Simple T-line		
<pre>*PULSE source parameters *      initial  pulse  delay  trise  tfall  pulse  period *      value   value          width *      PULSE(   0     1.0    2e-9   10p   10p   20e-9   80e-9)</pre>		
<pre>*1.0v square wave source; 1ns delay, 100pS edges, 20ns pulse width, 40ns cycle time Vin vin 0 1.0 PULSE(0 1.0 1e-9 100p 100p 20e-9 80e-9)</pre>		
<pre>*source output impedance rsrc vin tline_input 50</pre>		
<pre>*transmission line, 50 ohm, 2ns electrical length t1 tline_input 0 tline_output 0 z0=50 td=2ns</pre>		
<pre>*termination at end of T-line rload tline_output 0 100</pre>		
<pre>.control set hcopydevtype=postscript</pre>		
<pre>* color0 is background color * color1 is the grid and text color * colors 2-15 are for the vectors if you want to specify them * uncomment next three lines to plot colors on white background set hcopypscolor=true set color0=rgb:f/f/f set color1=rgb:0/0/0</pre>		
<pre>* to print the results directly to a printer uncomment the following line * set hcopydev=kec3112</pre>		
<pre>* run DC operating point simulation first op</pre>		
<pre>*run transient simulation for 20ns with timesteps of 100ps tran 100ps 20ns</pre>		
<pre>*plot nodes tline_input and tline_output every 1ns for 20ns plot V(tline_input) V(tline_output) xl 1ns 20ns</pre>		
<pre>*plot to .ps file nodes tline_input and tline_output every 1ns for 45ns hardcopy original.ps V(tline_input) V(tline_output) xl 0.1ns 20ns</pre>		
<pre>.endc .end</pre>		

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Simple T-line		
<pre>*PULSE source parameters *      initial  pulse  delay  trise  tfall  pulse  period *      value   value          width *      PULSE(   0     1.0    2e-9   10p   10p   20e-9   80e-9)</pre>		
<pre>*1.0v square wave source; 1ns delay, 100pS edges, 20ns pulse width, 40ns cycle time Vin vin 0 1.0 PULSE(0 1.0 1e-9 100p 100p 20e-9 80e-9)</pre>		
<pre>*source output impedance rsrc vin tline_input 80</pre>		
<pre>*transmission line, 50 ohm, 2ns electrical length t1 tline_input 0 tline_output 0 z0=50 td=2ns</pre>		
<pre>*termination at end of T-line rload tline_output 0 20</pre>		
<pre>.control set hcopydevtype=postscript</pre>		
<pre>* color0 is background color * color1 is the grid and text color * colors 2-15 are for the vectors if you want to specify them * uncomment next three lines to plot colors on white background set hcopypscolor=true set color0=rgb:f/f/f set color1=rgb:0/0/0</pre>		
<pre>* to print the results directly to a printer uncomment the following line * set hcopydev=kec3112</pre>		
<pre>* run DC operating point simulation first op</pre>		
<pre>*run transient simulation for 20ns with timesteps of 100ps tran 100ps 20ns</pre>		
<pre>*plot nodes tline_input and tline_output every 1ns for 20ns plot V(tline_input) V(tline_output) xl 1ns 20ns</pre>		
<pre>*plot to .ps file nodes tline_input and tline_output every 1ns for 45ns hardcopy q1.ps V(tline_input) V(tline_output) xl 0.1ns 20ns</pre>		
<pre>.endc .end</pre>		

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Simple T-line		
<pre>*PULSE source parameters *      initial  pulse  delay  trise  tfall  pulse  period *      value   value          width *      PULSE(   0     1.0    2e-9   10p   10p   20e-9   80e-9)</pre>		
<pre>*1.0v square wave source; 1ns delay, 100pS edges, 20ns pulse width, 40ns cycle time Vin vin 0 1.0 PULSE(0 1.0 1e-9 100p 100p 20e-9 80e-9)</pre>		
<pre>*source output impedance rsrc vin tline_input 20</pre>		
<pre>*transmission line, 50 ohm, 2ns electrical length t1 tline_input 0 tline_output 0 z0=50 td=2ns</pre>		
<pre>*termination at end of T-line rload tline_output 0 80</pre>		
<pre>.control set hcopydevtype=postscript</pre>		
<pre>* color0 is background color * color1 is the grid and text color * colors 2-15 are for the vectors if you want to specify them * uncomment next three lines to plot colors on white background set hcopypscolor=true set color0=rgb:f/f/f set color1=rgb:0/0/0</pre>		
<pre>* to print the results directly to a printer uncomment the following line * set hcopydev=kec3112</pre>		
<pre>* run DC operating point simulation first op</pre>		
<pre>*run transient simulation for 20ns with timesteps of 100ps tran 100ps 20ns</pre>		
<pre>*plot nodes tline_input and tline_output every 1ns for 20ns plot V(tline_input) V(tline_output) xl 1ns 20ns</pre>		
<pre>*plot to .ps file nodes tline_input and tline_output every 1ns for 45ns hardcopy q2.ps V(tline_input) V(tline_output) xl 0.1ns 20ns</pre>		
<pre>.endc .end</pre>		

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Simple T-line		
<pre>*PULSE source parameters *      initial  pulse  delay  trise  tfall  pulse  period *      value   value          width *      PULSE(   0     1.0    2e-9   10p   10p   20e-9   80e-9)</pre>		
<pre>*1.0v square wave source; 1ns delay, 100pS edges, 20ns pulse width, 40ns cycle time Vin vin 0 1.0 PULSE(0 1.0 1e-9 100p 100p 20e-9 80e-9)</pre>		
<pre>*source output impedance rsrc vin tline_input 10</pre>		
<pre>*transmission line, 50 ohm, 2ns electrical length t1 tline_input 0 tline_output 0 z0=50 td=2ns</pre>		
<pre>*termination at end of T-line rload tline_output 0 25</pre>		
<pre>.control set hcopydevtype=postscript</pre>		
<pre>* color0 is background color * color1 is the grid and text color * colors 2-15 are for the vectors if you want to specify them * uncomment next three lines to plot colors on white background set hcopypscolor=true set color0=rgb:f/f/f set color1=rgb:0/0/0</pre>		
<pre>* to print the results directly to a printer uncomment the following line * set hcopydev=kec3112</pre>		
<pre>* run DC operating point simulation first op</pre>		
<pre>*run transient simulation for 20ns with timesteps of 100ps tran 100ps 20ns</pre>		
<pre>*plot nodes tline_input and tline_output every 1ns for 20ns plot V(tline_input) V(tline_output) xl 1ns 20ns</pre>		
<pre>*plot to .ps file nodes tline_input and tline_output every 1ns for 45ns hardcopy q3.ps V(tline_input) V(tline_output) xl 0.1ns 20ns</pre>		
<pre>.endc .end</pre>		

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q4.sp

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```

Simple T-line
*PULSE source parameters
*      initial   pulse   delay   trise   tfall   pulse   period
*      value     value           width
*      PULSE(    0       1.0    2e-9    10p    10p    20e-9    80e-9)

*1.0v square wave source; 1ns delay, 100pS edges, 20ns pulse width, 40ns cycle time
Vin vin 0 1.0 PULSE(0 1.0 1e-9 100p 100p 20e-9 80e-9)

*source output impedance
rsrc vin tline_input 100

*transmission line, 50 ohm, 2ns electrical length
t1 tline_input 0 tline_output 0 z0=50 td=2ns

*termination at end of T-line
rload tline_output 0 200

.control
  set hcopydevtype=postscript
* color0 is background color
* color1 is the grid and text color
* colors 2-15 are for the vectors if you want to specify them
* uncomment next three lines to plot colors on white background
  set hcopypscolor=true
  set color0=rgb:f/f/f
  set color1=rgb:0/0/0

* to print the results directly to a printer uncomment the following line
* set hcopydev=kec3112

* run DC operating point simulation first
op

*run transient simulation for 20ns with timesteps of 100ps
tran 100ps 20ns

*plot nodes tline_input and tline_output every 1ns for 20ns
plot V(tline_input) V(tline_output) xl 1ns 20ns

*plot to .ps file nodes tline_input and tline_output every 1ns for 45ns
hardcopy q4.ps V(tline_input) V(tline_output) xl 0.1ns 20ns

.endc
.end

```