

cmptr_2.ece

Attributes

```

mainnodes: p n
ind_nodes: node_x1 node_x2
rparms:
+   v_high=1.0 v_low=0
+   eps1=1.0e-6 delta_tmin=1.0e-6 delta_tnrml=1m

```

Description

cmptr_2.ece is a comparator which compares the voltages at nodes `node_x1` and `node_x2`. The output voltage appears between nodes `p` and `n`; its value is `v_high` if $v(\text{node_x1}) > v(\text{node_x2})$; else, it is `v_low`.

The parameters `delta_tmin`, `delta_tnrml`, and `eps1` are used for controlling the simulator time steps. Additional time points are forced, depending on the values of `delta_tmin` and `delta_tnrml`, when $v(\text{node_x1})$ and $v(\text{node_x2})$ are within `eps1` of each other. This feature allows accurate simulation without having to make the average time step very small. Generally, `delta_tnrml` should be made equal to the typical simulator time step (`delt_const`) while `delta_tmin` should be made much smaller (say, by a factor of 100).

AC behaviour is not implemented.

Fig. 1 shows typical waveforms obtained with `cmptr_2.ece`. The corresponding circuit file (available as `cmptr_2_ece.in` in the examples directory) is reproduced below.

```

title: testing of cmptrtr_2

begin_circuit
  eelement type=triangle_2 p=a n=0 i0=0 tperiod=8m t0=0
+   v_high=1 v_low=-1 epsl=1u

  eelement type=triangle_2 p=b n=0 i0=1 tperiod=8m t0=0
+   v_high=1 v_low=-1 epsl=1u

  eelement type=cmptrtr_2 node_x1=a node_x2=b
+   p=c n=0 v_high=1.2 epsl=1.0e-6
+   delta_tmin=0.20u delta_tnrml=1.00m
  eelement type=r p=c n=0 r=1
  refnode=0

  outvar:
+   va=nodev_of_a
+   vb=nodev_of_b
+   vc=nodev_of_c
end_circuit

begin_solve
  solve_type=startup
  initial_sol initialize
  method: t_startup=0
end_solve

begin_solve
  solve_type=trns
  initial_sol previous
  begin_output
    filename=cmptrtr_2_ece.dat limit_lines=10000
    variables: va vb vc
  end_output
  method: itmax_trns=10000
+   back_euler=yes
+   t_start=0 t_end=20m delt_const=0.80m delt_min=0.1u
end_solve

end_cf

```

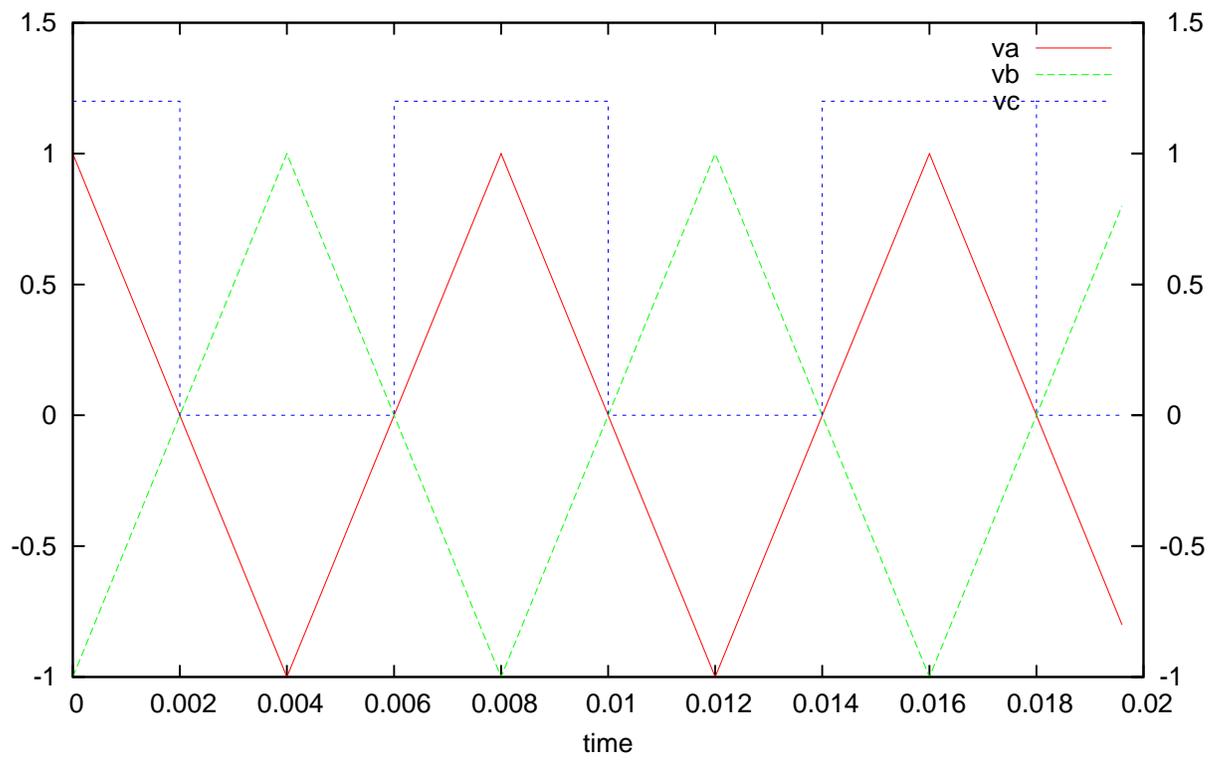


Figure 1: Waveforms obtained with `cmptrtr_2.ece` (see the circuit file for details).