cmprtr_1.ece

Attributes

```
  mainnodes: p n
  main_var: x1 x2
  rparms:
+     v_high=1.0 v_low=0
+     epsl=1.0e-6 delta_tmin=1.0e-6 delta_tnrml=1m
```

Description

cmprtr_1.ece is a comparator which compares general variables x1 and x2. The output voltage appears between nodes p and n; its value is v_high if x1 > x2; else, it is v_low.

The parameters delta_tmin, delta_tnrml, and epsl are used for controlling the simulator time steps. Additional time points are forced, depending on the values of delta_tmin and delta_tnrml, when x1 and x2 are within epsl 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 cmprtr_1.ece. The corresponding circuit file (available as cmprtr_1_ece.in in the examples directory) is reproduced below.

```
title: testing of cmprtr_1

begin_circuit
    gelement type=triangle_2 y=x1 i0=0 tperiod=8m t0=0
+       g_high=1 g_low=-1 epsl=1u

    gelement type=triangle_2 y=x2 i0=1 tperiod=8m t0=0
+       g_high=1 g_low=-1 epsl=1u

    eelement type=cmprtr_1 x1=x1 x2=x2 p=a n=0 v_high=1.2 epsl=1.0e-6
+       delta_tmin=0.20u delta_tnrml=1.00m
    eelement type=r p=a n=0 r=1
    refnode=0

    outvar:
+       x1=var_of_x1
+       x2=var_of_x2
+       va=nodev_of_a
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=cmprtr_1_ece.dat limit_lines=10000
        variables: x1 x2 va
    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
```
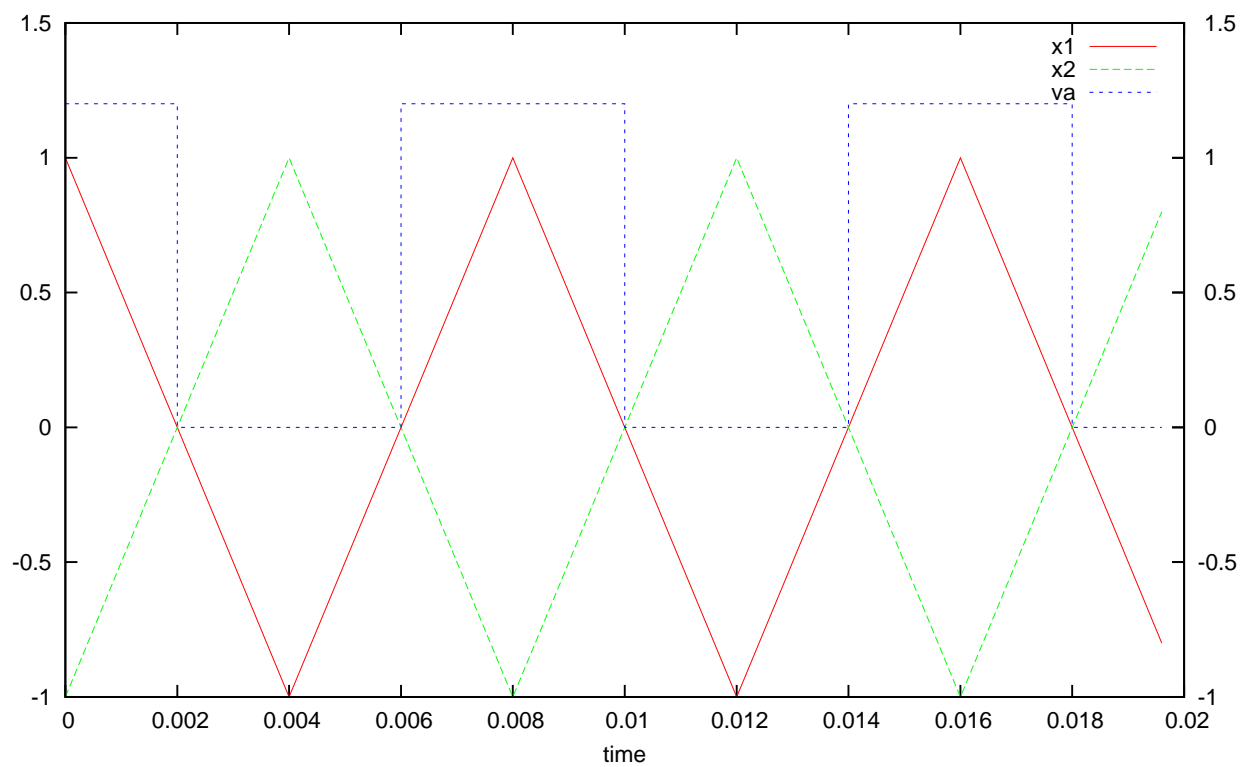
Figure 1: Waveforms obtained with cmprtr_1.ece (see the circuit file for details).