clock.ece

Attributes

```
  mainnodes: p n
  outvar: v1=v1_of_v0 i1=cur(p)_of_v0
  iparms: i0=0
  rparms:
+   t1=1
+   t2=2
+   t0=0
+   v_high=1.0
+   dt1=0.01
+   dt2=0.01
+   v_low=0
```

Description

`clock.ece` is a square wave voltage source. The parameters have the following meaning:

`t1:` The first part of one period. The voltage is equal to `v_low` in this interval if `i0`=0 and `v_high` if `i0`=1.

`t2:` The second part of one period.

`t0:` the "offset" with respect to $t = 0$.

`dt1:` Width of the transition at the beginning of the `t1` phase.

`dt2:` Width of the transition at the beginning of the `t2` phase.

Note that the transition width is included in `t1` or `t2`. For example, if `t1`=10, `dt1`=1.5, and `i0`=1, then the `t1` phase consists of a rising edge for 1.5 s and an interval of 8.5 s with a constant level equal to `g_high`.

The output variable `i1` gives the current through the element from `p` to `n` and `v1` gives the voltage drop from `p` to `n`.
AC behaviour is not implemented.

The effect of the various paramters of `clock.ece` on the waveforms is shown in Fig. 1. The corresponding circuit file is given below.

```
title: testing of clock.ece

begin_circuit
   eelement type=clock p=a n=0 v_high=1
+     t1=10 t2=20 dt1=1 dt2=1 i0=0

   eelement type=clock p=b n=0 v_high=1
+     t1=10 t2=20 dt1=2 dt2=4 i0=1

   eelement type=r p=a n=b r=1
   refnode=0
   outvar:
+    va=nodev_of_a
+    vb=nodev_of_b
end_circuit

begin_solve
   solve_type=dc
   initial_sol initialize
end_solve

begin_solve
   solve_type=trns
   initial_sol previous
   begin_output
      filename=clocktest3.dat
      variables: va vb
   end_output
   method: norm_2=1.0e-6 back_euler=yes
+    t_start=0 t_end=100 delt_const=1
end_solve

end_cf
```

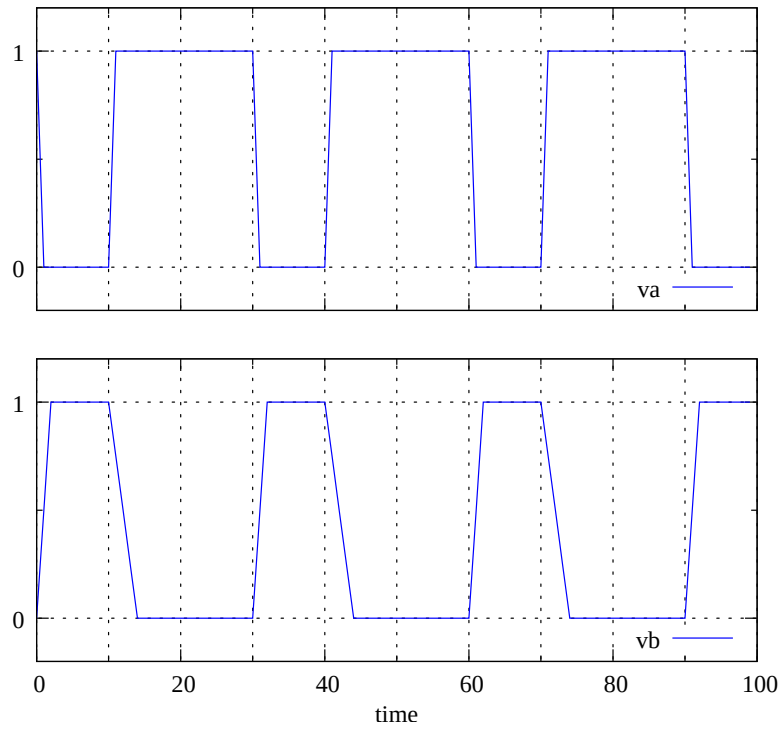

Figure 1: Waveforms obtained with `clock.ece`: (a) `v_high`=1, `t1`=10, `t2`=20, `dt1`=1, `dt2`=1, `i0`=0. (b) `v_high`=1, `t1`=10, `t2`=20, `dt1`=2, `dt2`=4, `i0`=1.