triangle_3.ece

Attributes

```
  mainnodes: p n
  outvar: i1=brc_of_v0 v1=brv_of_v0
  iparms: i0=0
  rparms:
+    freq0=10  t0=0  v_high=1.0  v_low=-1.0
+    epsl=1.0e-9
```

Description

triangle_3.ece is a triangular wave voltage source connected between nodes p and n. The parameters have the following meaning:

freq0: Frequency. In the first half, the voltage goes from v_high to v_low if i0=0 (and from v_low to v_high if i0=1).

t0: An "offset" time interval. Its meaning will become clear in the following example.

epsl: Used in time step control. epsl can generally be set to be $0.001 \times \min(\mathtt{t1}, \mathtt{t2})$.

The output variables i1 and v1 are the branch current and branch voltage, respectively.

AC behaviour is not implemented.

The effect of the various paramters of triangle_3.ece on the waveforms is shown in Fig. 1. The corresponding circuit file (available as triangle_3_ece.in in the examples directory) is reproduced below.

```
title: testing of triangle_3.ece

begin_circuit
   eelement type=triangle_3 p=a n=0
+      freq0=0.2 t0=0 i0=0 v_high=2 v_low=-2 epsl=1e-3

   eelement type=triangle_3 p=b n=0
+      freq0=0.2 t0=0 i0=1 v_high=2 v_low=-2 epsl=1e-3

   eelement type=triangle_3 p=c n=0
+      freq0=0.2 t0=1.5 i0=0 v_high=2 v_low=-2 epsl=1e-3

   eelement type=r p=a n=b r=1
   eelement type=r p=b n=c 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
end_solve

begin_solve
   solve_type=trns
   initial_sol previous
   begin_output
      filename=triangle_3_ece.dat
      variables: va vb vc
   end_output
   method:
+      back_euler=yes
+      t_start=0 t_end=16 delt_const=0.5 delt_min=0.1
end_solve

end_cf
```
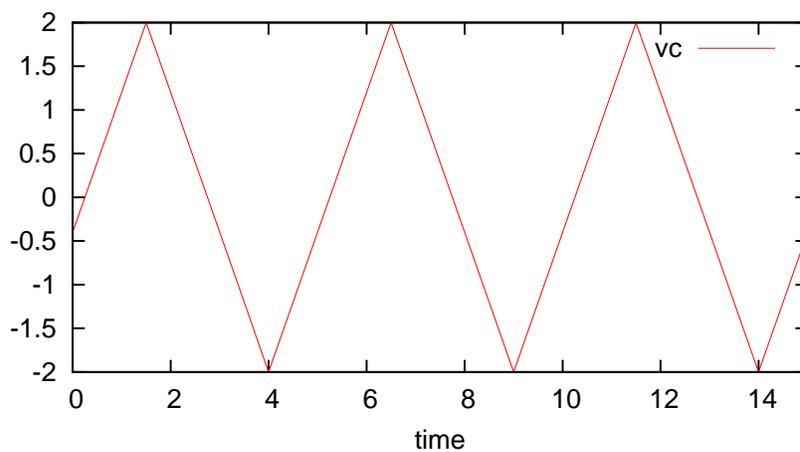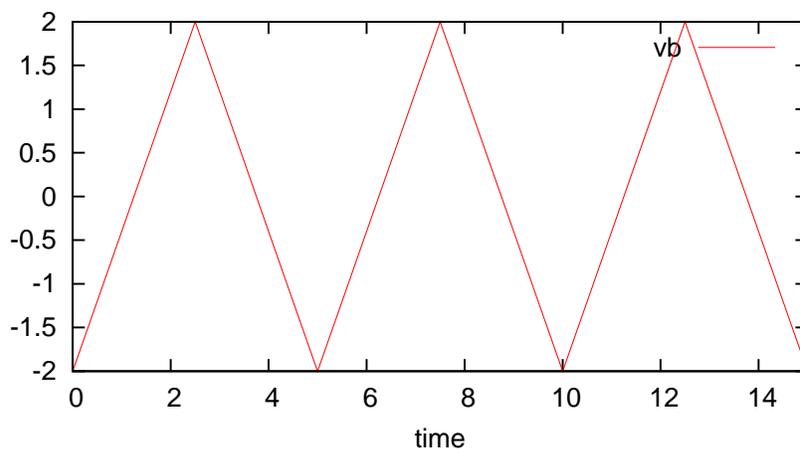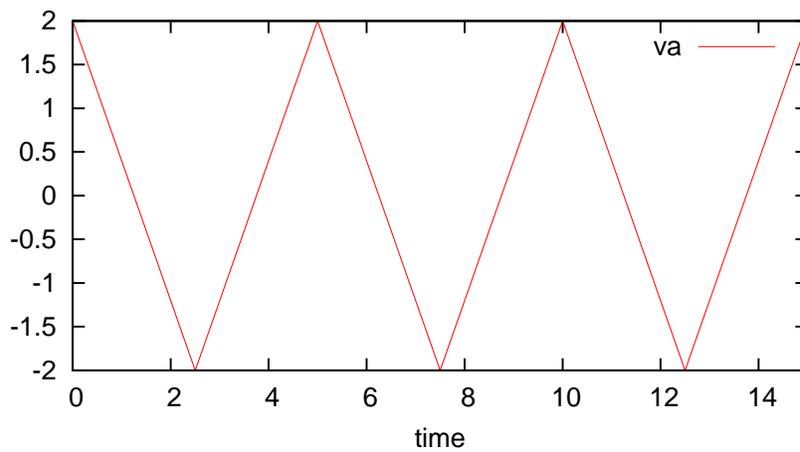
Figure 1: Waveforms obtained with `triangle_3.ece`: (a) `va`: `freq0=0.2`, `t0=0`, `i0=0`, `v_high=2`, `v_low=-2`, (b) `vb`: `freq0=0.2`, `t0=0`, `i0=1`, `v_high=2`, `v_low=-2`, (c) `vc`: `freq0=0.2`, `t0=1.5`, `i0=0`, `v_high=2`, `v_low=-2`.