p ⟶ i1 — (+ −) — n

+   v1   −

vpulse.ece

Attributes

```
mainnodes: p n
outvar: i1=brc_of_v0 v1=brv_of_v0
rparms: v_1=0 v_2=0 t_1=0 t_2=0 delt_1=0 delt_2=0
```

Description

`vpulse.ece` is a pulse voltage source connected between nodes `p` and `n`. The parameters have the following meaning:

t1: Time of the first transition (from v_1 to v_2).

t2: Time of the second transition (from v_2 to v_1).

delt_1: Width of the transition at t_1.

delt_2: Width of the transition at t_2.

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 `vpulse.ece` on the waveforms is shown in Fig. 1. The corresponding circuit file (available as `vpulse_ece.in` in the examples directory) is reproduced below.

```
title: testing of vpulse.ece

begin_circuit
    eelement name=vin type=vpulse p=a n=0 v_1=0 v_2=5
+      t_1=10 t_2=30 delt_1=2 delt_2=4
    eelement name=vin type=vpulse p=b n=0 v_1=5 v_2=0
+      t_1=10 t_2=30 delt_1=1 delt_2=1
    eelement type=r p=a n=b r=10
    refnode=0
    outvar:
+    va=nodev_of_a
+    vb=nodev_of_b
end_circuit

begin_solve
    solve_type=dc
    initial_sol initialize
    method: t_dc=0.0
end_solve

begin_solve
    solve_type=trns
    initial_sol previous
    begin_output
        filename=vpulse_ece.dat
        variables: va vb
    end_output
    method: back_euler=yes
+    t_start=0 t_end=40 delt_const=1
end_solve

end_cf
```
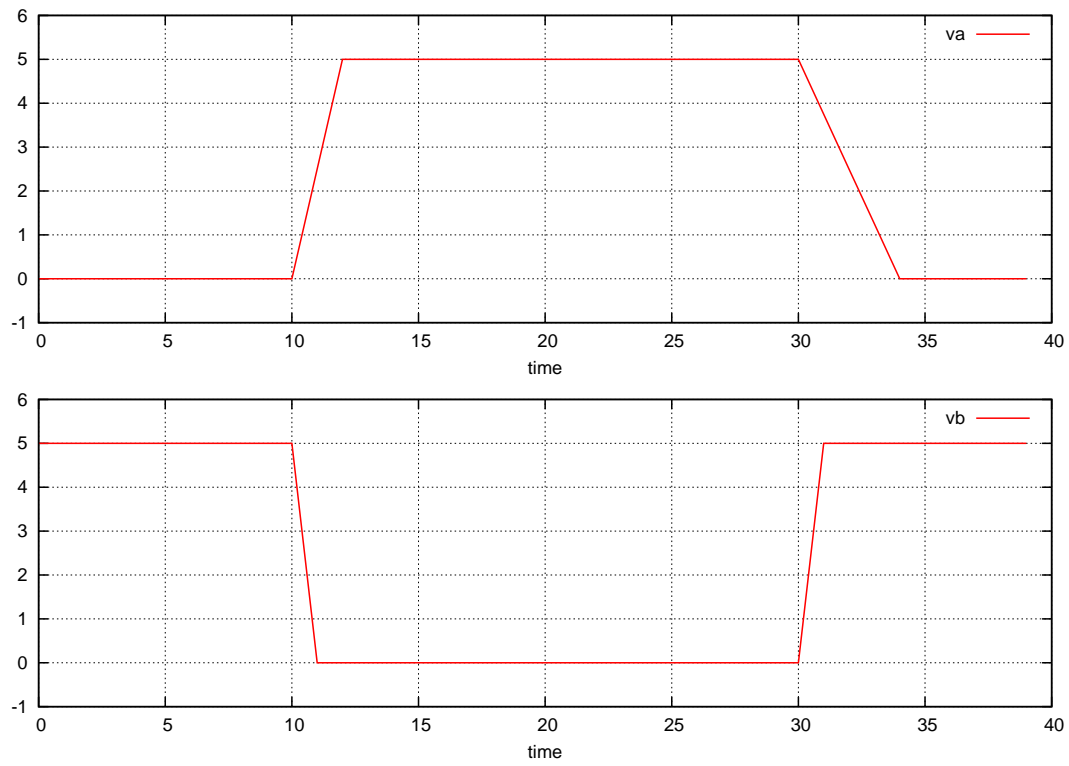
Figure 1: Waveforms obtained with `vpulse.ece`: (a) `v_1=0`, `v_2=5`, `t_1=10`, `t_2=30`, `delt_1=2`, `delt_2=4`, (b) `v_1=5`, `v_2=0`, `t_1=10`, `t_2=30`, `delt_1=1`, `delt_2=1`.