

triangle_1.gce

Attributes

```
mainvars: y
iparms: i0=0
rparms:
+   t1=1 t2=1 t0=0 g_high=1.0 g_low=-1.0
+   eps1=1.0e-9
```

Description

`triangle_1.gce` is a triangular wave source with the general variable `y` as its output. The parameters have the following meaning:

t1: The first part of one period. `y` goes from `g_high` to `g_low` in this interval if `i0=0` (and from `g_low` to `g_high` if `i0=1`).

t2: The second part of one period.

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

eps1: Used in time step control. `eps1` can generally be set to be $0.001 \times \min(t1, t2)$.

AC behaviour is not implemented.

The effect of the various parameters of `triangle_1.gce` on the waveforms is shown in Fig. 1. The corresponding circuit file (available as `triangle_1_gce.in` in the examples directory) is reproduced below.

```

title: testing of triangle_1

begin_circuit
    gelement type=triangle_1 y=y1 t1=2 t2=3 t0=0 i0=0
+    g_high=2 g_low=-2 epsl=1e-3

    gelement type=triangle_1 y=y2 t1=2 t2=3 t0=0 i0=1
+    g_high=2 g_low=-2 epsl=1e-3

    gelement type=triangle_1 y=y3 t1=2 t2=3 t0=1.5 i0=0
+    g_high=2 g_low=-2 epsl=1e-3

    outvar:
+    y1=var_of_y1
+    y2=var_of_y2
+    y3=var_of_y3
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=triangle_1_gce.dat
        variables: y1 y2 y3
    end_output
    method:
+    back_euler=yes
+    t_start=0 t_end=16 deltax=0.5 deltax_min=0.1
end_solve

end_cf

```

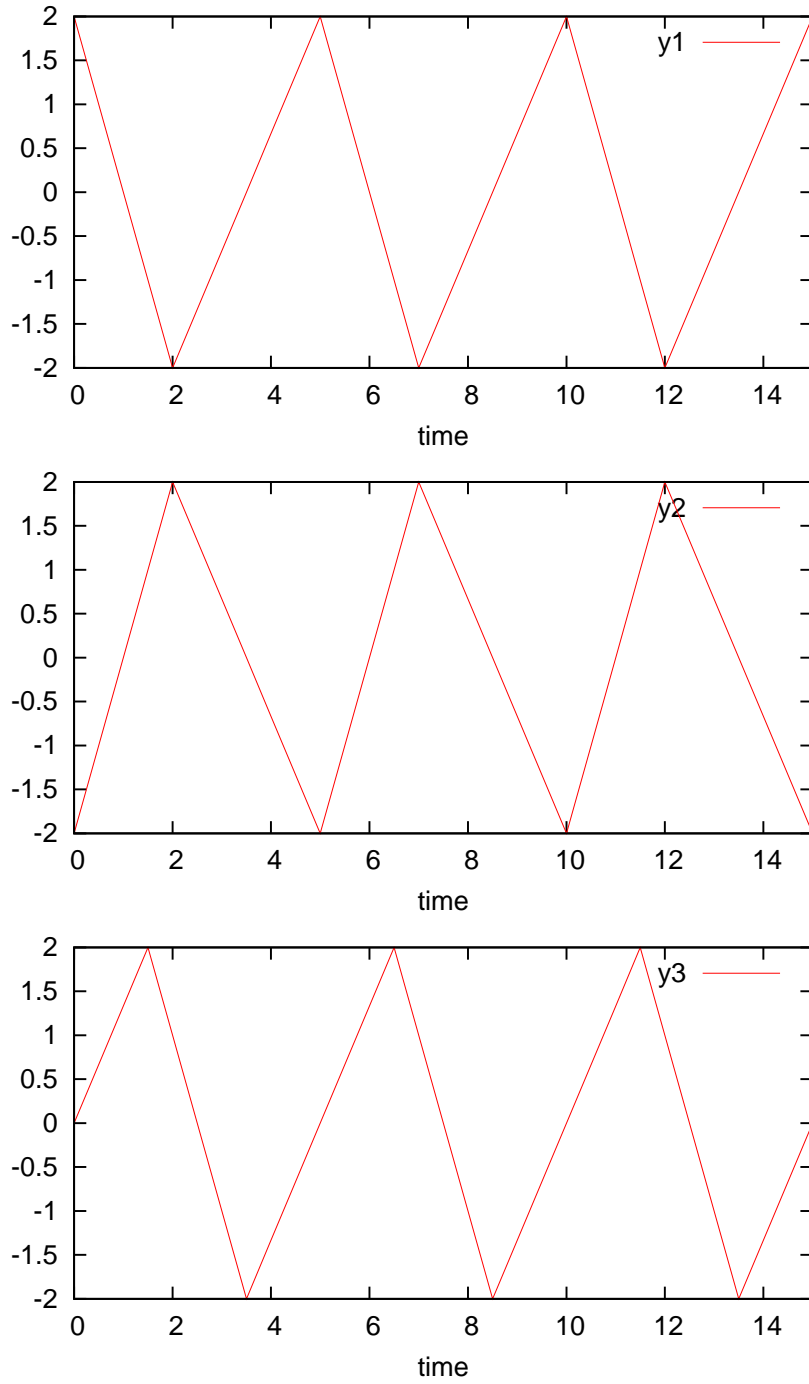


Figure 1: Waveforms obtained with `triangle_1.gce`: (a) y_1 : $t_1=2$, $t_2=3$, $t_0=0$, $i_0=0$, $g_{high}=2$, $g_{low}=-2$, (b) y_2 : $t_1=2$, $t_2=3$, $t_0=0$, $i_0=1$, $g_{high}=2$, $g_{low}=-2$, (c) y_3 : $t_1=2$, $t_2=3$, $t_0=1.5$, $i_0=0$, $g_{high}=2$, $g_{low}=-2$.