

triangle_3.gce

Attributes

```
mainvars: y
iparms: i0=0
rparms:
+   freq0=10  t0=0  v_high=1.0  v_low=-1.0
+   epsl=1.0e-9
```

Description

triangle_3.gce is a symmetric triangular wave source with the general variable **y** as its output.

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 $0.001 \times \min(\mathbf{t1}, \mathbf{t2})$.

AC behaviour is not implemented.

The effect of the various parameters of **triangle_3.gce** on the waveforms is shown in Fig. 1. The corresponding circuit file (available as **triangle_3_gce.in** in the examples directory) is reproduced below.

```

title: testing of triangle_3

begin_circuit
    gelement type=triangle_3 y=y1 freq0=0.2 t0=0 i0=0
+    g_high=2 g_low=-2 epsl=1e-3

    gelement type=triangle_3 y=y2 freq0=0.2 t0=0 i0=1
+    g_high=2 g_low=-2 epsl=1e-3

    gelement type=triangle_3 y=y3 freq0=0.2 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_3_gce.dat
        variables: y1 y2 y3
    end_output
    method:
+    back_euler=yes
+    t_start=0 t_end=16 delt_const=0.5 delt_min=0.1
end_solve

end_cf

```

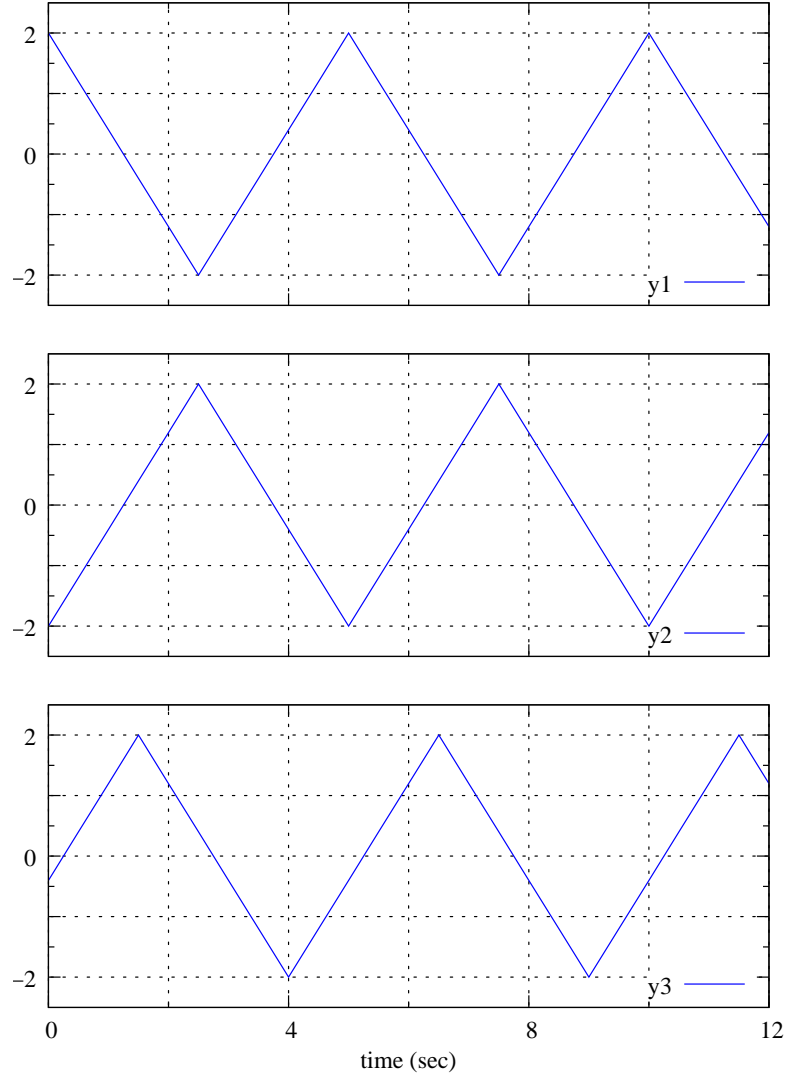


Figure 1: Waveforms obtained with `triangle_3.gce`: (a) $y1$: $\text{freq0}=0.2$, $t0=0$, $i0=0$, $v_high=2$, $v_low=-2$, (b) $y2$: $\text{freq0}=0.2$, $t0=0$, $i0=1$, $v_high=2$, $v_low=-2$, (c) $y3$: $\text{freq0}=0.2$, $t0=1.5$, $i0=0$, $v_high=2$, $v_low=-2$.