

rms_mv.gce

Attributes

```
mainvars: x_in x_out x_cntrl
iparms: n_samples=20 index=1
rparms: delt=1
```

Description

`rms_mv.gce` can be used to compute a “moving” rms value of a signal `x_in`, with the general variable `x_out` as its output. It is triggered by a clock signal at `x_cntrl`. The average value `x_out` gets updated for each pulse at `x_cntrl`. Typically, one would keep the clock period much smaller than the time period over which the average value is desired. The parameters have the following meaning:

n_samples: Number of samples for which the rms value of `x_in` is to be computed.

index: Index of the element. If more than one elements of this type are used in the circuit file, they should be assigned different index values.

delt: Time interval between the clock pulses applied at `x_cntrl`.

AC behaviour is not implemented.

The following circuit file shows how `rms_mv.gce` can be used. The output obtained is shown in Fig. 1.

```
title: testing of average_mv.in and rms_av.in
greal t1=0.01m t2=0.09m t1pt2=0.1m
ginteger n_samples=10

begin_circuit
# triggering pulses:
  gelement type=clock y=y g_high=1
+   t1=t1 t2=t2 dt1=0.001m dt2=0.001m i0=1 t0=0

# a small triangle wave superimposed on a large sine wave:
  gelement type=vsrcac vxn=x1 a=1 f_hz=50 t0=0 phi=0
  gelement type=triangle_2 y=x2 i0=0 tperiod=1m t0=0.25m
+   g_high=0.05 g_low=-0.05 epsl=1u
```

```

gelement type=sum_2 x1=x1 x2=x2 y=x

# moving average and rhs meters:
gelement type=average_mv x_in=x x_out=x_avg x_cntrl=y
+   delt=t1pt2 n_samples=n_samples index=1
gelement type=rms_mv      x_in=x x_out=x_rms x_cntrl=y
+   delt=t1pt2 n_samples=n_samples index=1

outvar:
+   x=var_of_x
+   x_avg=var_of_x_avg
+   x_rms=var_of_x_rms
+   y=var_of_y
end_circuit

begin_solve
  solve_type=startup
  initial_sol initialize
end_solve

begin_solve
  solve_type=trns
  initial_sol previous
  begin_output
    filename=avg2a_gce.dat limit_lines=100000
    variables: x x_avg x_rms y
  end_output
  method: itmax_trns=100000
+   back_euler=yes
+   t_start=0 t_end=60m delt_const=0.02m delt_min=0.1u
+   n_wrtiterno=1000
end_solve

end_cf

```

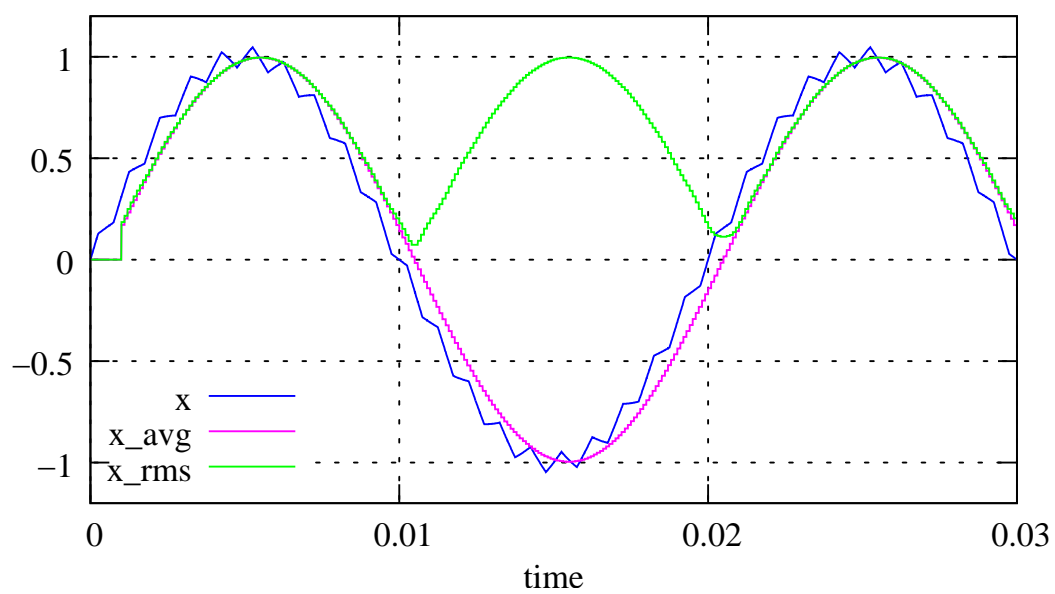


Figure 1: Waveforms obtained with `rms_mv.gce`.