

average_mv.xce

Attributes

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

Description

`average_mv.xce` can be used to produce a “moving average” of a signal `x_in`, with `x_out` as the output. A clock signal at `x_cntrl` is used to sample the input `x_in`. The samples are averaged to produce `x_out`, a “moving average” since it gets updated every clock cycle. 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 `x_in` is to be averaged.

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

AC behaviour is not implemented.

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

```
begin_circuit
# signal to be averaged:
  xelement type=srcac y=x a=1 f_hz=50 t0=0 dc=0.5

# triggering pulses:
  xelement type=clock y=clk x_high=1
+   t1=0.1m t2=0.1m dt1=0.001m dt2=0.001m i0=0 t0=0

  xelement type=average_mv x_in=x x_out=x_avg_mv x_cntrl=clk
+   delt=0.2m n_samples=100

  outvar:
+   x=xvar_of_x
+   clk=xvar_of_clk
+   x_avg_mv=xvar_of_x_avg_mv
end_circuit
```

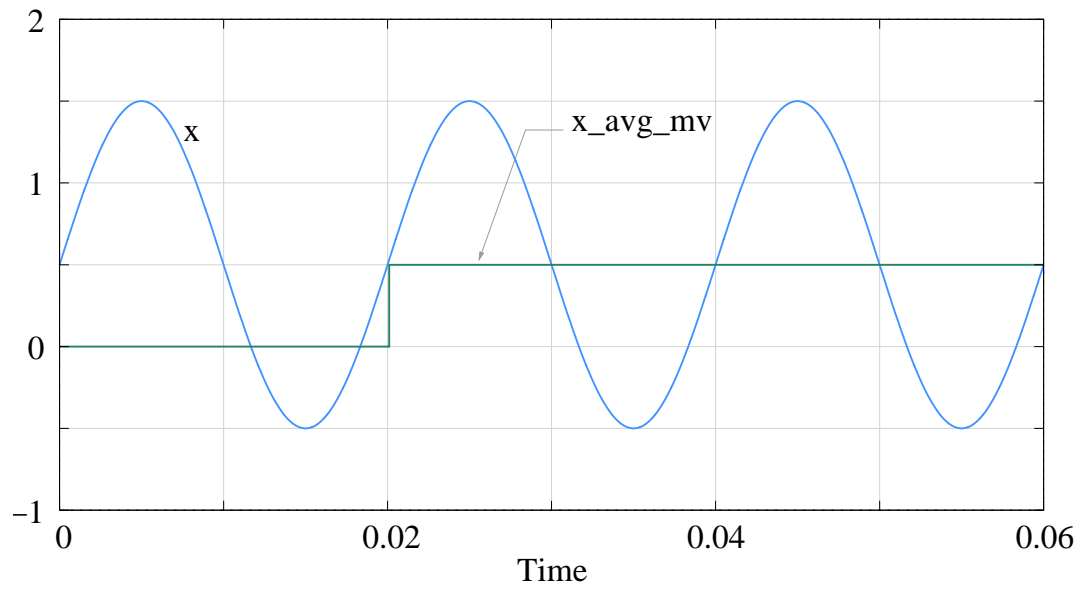


Figure 1: Waveforms obtained with `average_mv.xce`.

```
begin_solve
  solve_type=trns
  begin_output
    filename=xtest35.dat limit_lines=100000
    variables: x clk x_avg_mv
  end_output
  method: itmax_trns=100000
+   forward_euler=yes
+   t_start=0 t_end=60m delt_const_x=0.06m delt_min_x=0.1u
+   n_wrtiterno=1000
end_solve
```