

## filter\_z0\_p5.gce

### Attributes

```
mainvars: x y
stparams: y_sv=0 y1_sv=0 y2_sv=0 y3_sv=0 y4_sv=0
rparams: a0=1 b0=1 b1=1 b2=1 b3=1 b4=1 b5=1 f0=0.15915
```

### Description

filter\_z0\_p5.gce satisfies the  $s$ -domain relationship,

$$y(s) = \frac{a_0}{b_0 + b_1 s + b_2 s^2 + b_3 s^3 + b_4 s^4 + b_5 s^5} x(s).$$

f0 specifies the frequency value to be used for scaling of the filter coefficients, the default value being  $1/2\pi$  Hz. The start-up parameters y\_sv, y1\_sv, y2\_sv, y3\_sv, and y4\_sv provide the starting values for  $y$ ,  $dy/dt$ ,  $d^2y/dt^2$ ,  $d^3y/dt^3$ , and  $d^4y/dt^4$ , respectively, in start-up simulation.

Note that there are two options for assigning the filter coefficients:

- (a) Enter coefficients for  $\omega_c = 1$  rad/s and then enter the actual (desired)  $f_c$  in Hz.
- (b) Enter coefficients as required for the desired  $f_c$  but leave the default value of f0 unchanged.

In the first case, the coefficients will be changed internally; in the second case, they will be taken as assigned by the user.

In AC analysis, the above equation holds (with  $s = j\omega$ ).