

filter_z5_p5.gce

Attributes

```
mainvars: x y
stparams:
+   x_sv=0 x1_sv=0 x2_sv=0 x3_sv=0 x4_sv=0
+   y_sv=0 y1_sv=0 y2_sv=0 y3_sv=0 y4_sv=0
rparams:
+   a0=1 a1=1 a2=1 a3=1 a4=1 a5=1
+   b0=1 b1=1 b2=1 b3=1 b4=1 b5=1
+   f0=0.15915
```

Description

filter_z5_p5.gce satisfies the s -domain relationship,

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

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 `x_sv`, `x1_sv`, `x2_sv`, `x3_sv`, `x4_sv`, `y_sv`, `y1_sv`, `y2_sv`, `y3_sv`, and `y4_sv` provide the starting values for x , dx/dt , d^2x/dt^2 , d^3x/dt^3 , d^4x/dt^4 , 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 $s = j\omega$).