Vector Function Example

Expression **avg(V(Probe2))**
Complete the following steps:

1. Select `avg()` in the **Functions** column and click **Copy function to expression**.

   `avg()` appears in the **Expressions** column.
2. Select `V(Probe2)` in the **Variables** column and click **Copy variable to expression**.

   The expression changes to `avg(V(Probe2))`.

 Available **Variables** depend on the selection you make in **Select simulation results**.

Related Information

Available Vector Functions

Postprocessor Basic Steps

Available Vector Functions

The following vector functions are available in the **Postprocessor**:

Function	Description
avg(X)	Running average of the vector X where: $$\text{avg}(\mathbf{X}(x_i))_i = \frac{\int_{x_o}^{x_i} \mathbf{X}(x)dx}{x_i - x_o}$$
avgx(X, d)	Running average of the vector X over d where: $$\text{avgx}(\mathbf{X}(x_i))_i = \frac{\int_{x_i-d}^{x_i} \mathbf{X}(x)dx}{x_i - d}$$ if $x_i - d = x_0$, otherwise: $$\text{avgx}(\mathbf{X}(x_i))_i = \frac{\int_{x_o}^{x_i} \mathbf{X}(x)dx}{x_i - x_o}$$
deriv(X)	Vector derivative of X - uses numeric differentiation by interpolating a polynomial and may not produce satisfactory results, particularly with iterated differentiation. Only calculates the derivative with respect to the real component of the vector's scale.
envmax(X, n)	Upper envelope of the vector X where n is the number of points on either side of a peak that must be less than the value for a peak to be identified.
envmin(X, n)	Lower envelope of the vector X where n is the number of points on either side of a valley that must be greater than the value for a valley to be identified.
grpdelay	Group delay of vector X in seconds, where:

(X)	$\text{grpdelay}(\mathbf{X}(freq))_i = -\frac{1}{360}\left[\frac{d[\text{ph}(\mathbf{X}(freq))]}{dfreq}\right]_{freq_i} = -\frac{1}{360}\text{deriv}[\text{ph}(\mathbf{X}(freq))]_{freq_i}$
integral(X)	Running integral of vector X, where: $\text{integral}(\mathbf{X}(x_i))_i = \int_{x_o}^{x_i}\mathbf{X}(x)dx$
mag(X)	Vector magnitude.
ph(X)	Vector phase, in radians.
norm(X)	Vector X normalized to 1 where: $\text{norm}(\mathbf{X}) = \frac{\mathbf{X}}{\max(\text{abs}(\mathbf{X}))}$
rms(X)	Running RMS average of vector X where: $\text{rms}(\mathbf{X}(x_i))_i = \sqrt{\frac{\int_{x_o}^{x_i}\lvert\mathbf{X}(x)\rvert^2 dx}{x_i - x_o}}$
rnd(X)	Vector random.
mean(X)	Vector results in a scalar (a length 1 vector) that is the mean of the elements of the vector.
vector(n)	Results in a vector of length L, where L is floor(mag(n)). The elements of the new vector are 0, 1, 2, ..., L-1. If n is a vector, then just the first element of vector n will be used to determine the length of the new vector.
length(X)	Number of elements in the vector X.
max(X,Y)	Compares the elements of two vectors and returns a list containing the higher values.
min(X,Y)	Compares the elements of two vectors and returns a list containing the lower values.
vm(X)	Vector vm(x) = mag(v(X)).
vp(X)	Vector vp(x) = ph(v(X)).

Related Information

Postprocessor Basic Steps