Another common application is using autocorrelation (where *srcWaveName* and *destWaveName* are the same) to determine Power Spectral Density. In this case it better to use the **DSPPeriodogram** operation which provides more options.

See Also

Convolution on page III-284 and **Correlation** on page III-286 for illustrated examples. See the **Convolve** operation for algorithm implementation details, which are identical except for the lack of source wave reversal, and the lack of the /A (acausal) flag.

The **MatrixOp**, **StatsCorrelation**, **StatsCircularCorrelationTest**, **StatsLinearCorrelationTest**, and **DSPPeriodogram** operations.

References

An explanation of autocorrelation and Power Spectral Density (PSD) can be found in Chapter 12 of Press, William H., *et al*., *Numerical Recipes in C*, 2nd ed., 994 pp., Cambridge University Press, New York, 1992.

WaveMetrics provides Igor Technical Note 006, "DSP Support Macros" that computes the PSD with options such as windowing and segmenting. See the Technical Notes folder. Some of the techniques discussed there are available as Igor procedure files in the "WaveMetrics Procedures:Analysis:" folder.

Wikipedia: http://en.wikipedia.org/wiki/Correlation

Wikipedia: http://en.wikipedia.org/wiki/Cross_covariance

Wikipedia: http://en.wikipedia.org/wiki/Autocorrelation_function

cos

cos(*angle*)

The cos function returns the cosine of *angle* which is in radians.

In complex expressions, *angle* is complex, and `cos(`*angle*`)` returns a complex value:

$$\cos(x+iy) = \cos(x)\cosh(y) - i\sin(x)\sinh(y).$$

See Also

acos, **sin**, **tan**, **sec**, **csc**, **cot**

cosh

cosh(*num*)

The cosh function returns the hyperbolic cosine of *num*:

$$\cosh(x) = \frac{e^x + e^{-x}}{2}.$$

In complex expressions, *num* is complex, and `cosh(`*num*`)` returns a complex value.

See Also

sinh, **tanh**, **coth**

CosIntegral

CosIntegral(*z*)

The CosIntegral(z) function returns the cosine integral of z.

If z is real, a real value is returned. If z is complex then a complex value is returned.

The CosIntegral function was added in Igor Pro 7.00.

Details

The cosine integral is defined by