

1 Matlab Help on specgram

SPECGRAM Calculate spectrogram from signal.

`B = SPECGRAM(A,NFFT,Fs,WINDOW,NOVERLAP)` calculates the spectrogram for the signal in vector `A`. `SPECGRAM` splits the signal into overlapping segments, windows each with the `WINDOW` vector and forms the columns of `B` with their zero-padded, length `NFFT` discrete Fourier transforms. Thus each column of `B` contains an estimate of the short-term, time-localized frequency content of the signal `A`. Time increases linearly across the columns of `B`, from left to right. Frequency increases linearly down the rows, starting at 0. If `A` is a length `NX` complex signal, `B` is a complex matrix with `NFFT` rows and

`k = fix((NX-NOVERLAP)/(length(WINDOW)-NOVERLAP))`

columns. If `A` is real, `B` still has `k` columns but the higher frequency components are truncated (because they are redundant); in that case, `SPECGRAM` returns `B` with `NFFT/2+1` rows for `NFFT` even and `(NFFT+1)/2` rows for `NFFT` odd. If you specify a scalar for `WINDOW`, `SPECGRAM` uses a Hanning window of that length. `WINDOW` must have length smaller than or equal to `NFFT` and greater than `NOVERLAP`. `NOVERLAP` is the number of samples the sections of `A` overlap. `Fs` is the sampling frequency which does not effect the spectrogram but is used for scaling plots.

`[B,F,T] = SPECGRAM(A,NFFT,Fs,WINDOW,NOVERLAP)` returns a column of frequencies `F` and one of times `T` at which the spectrogram is computed. `F` has length equal to the number of rows of `B`, `T` has length `k`. If you leave `Fs` unspecified, `SPECGRAM` assumes a default of 2 Hz.

`B = SPECGRAM(A)` produces the spectrogram of the signal `A` using default settings; the defaults are `NFFT` = minimum of 256 and the length of `A`, a Hanning window of length `NFFT`, and `NOVERLAP` = `length(WINDOW)/2`. You can tell `SPECGRAM` to use the default for any parameter by leaving it off or using `[]` for that parameter, e.g. `SPECGRAM(A,[],1000)`

`SPECGRAM` with no output arguments plots the absolute value of the spectrogram in the current figure, using `IMAGESC(T,F,20*log10(ABS(B)))`, `AXIS XY`, `COLORMAP(JET)` so the low frequency content of the first portion of the signal is displayed in the lower left corner of the axes.

See also PSD