akiatoji / **spectrum.m**

Last active 5 years ago

Simple Matlab/Octave code to take time domain signal to frequency domain using FFT. With plots. Wheee!

spectrum.m

```matlab
1   % Take 100Hz signal, amplitude modulate it with 2.5KHz, then run it through FFT
2   clear ; close all; clc
3
4   freq1 = 100;
5   period1 = 1 / freq1;
6   w1 = 2 * pi * freq1;
7   num_tsteps = 1000;
8   num_periods = 2;
9   tstep = num_periods * period1 / num_tsteps;
10  t = 0:tstep:(num_periods * period1);
11  x1 = sin(w1 * t); plot(t, x1);
12
13  disp(['100Hz signal.  Press any key to continue']);
14  pause;
15
16  freq2 = 2500;
17  period2 = 1 / freq2;
18  w2 = 2 * pi * freq2;
19
20  x2 = sin(w2 * t);
21
22  x3 = x1 .* x2;
23  plot(t, x3);
24
25  disp(['Modulated with 2.5KHz signal.  Press any key to continue']);
26  pause;
27
28  n = 2**16;
29  f_s = num_tsteps / (period1*num_periods);
30
31  y = abs(fft(x3, n));
32  y = fftshift(y);
33  f = f_s*(-n/2:n/2-1)/n;
34  plot(f, y);
35  axis([1500, 3500]);
36
37  disp(['Frequency spectrum with FFT.  Press any key to continue']);
38  pause;
```