

MANUAL FOR SYSTEM IDENTIFICATION

1. Updated Spectrum Commands

The new commands in Matlab System Identification Toolbox by Ljung (2011) to plot different spectra are as shown in the box below:

psd	Power spectral density
cpsd	Cross Power Spectral Density
mscohere	Coherence function estimate
msspectrum	Mean-square (power) spectrum (MSS)
tfestimate	Transfer function estimate

Please note that unlike the power spectral density (PSD), the peaks in the MSS reflect the power in the signal at a given frequency. The MSS of a signal is the Fourier transform of the signal's autocorrelation.

Here is an example of how to use the functions:

```
Hs = spectrum.welch;  
figure; msspectrum(Hs,ui,'Fs',Fs)  
figure; psd(Hs,ui,'Fs',Fs);  
figure; cpsd(ui,yi,[],[],[],Fs,'twosided')  
[Cxy,w] = mscohere(ui,yi);  
figure; semilogy(w,Cxy); xlabel('rad/sec')  
figure; tfestimate(ui,yi)
```

2. References

Ljung, L. (2011): *System Identification Toolbox User's Guide*. The Math Works Inc., Natic, Mass.