eeg1\_tr=trial6.eeg1;

emg1\_tr=trial6.eeg7;

eeg1\_tr=eeg1\_tr\*(3.3/4096);

emg1\_tr=emg1\_tr\*(3.3/4096);

f\_data=length(emg1\_tr)/120;

t\_data=1/f\_data;

Time\_d=[0:1:length(eeg1\_tr)-1]\*t\_data;

plot(Time\_d,eeg1\_tr)

title('eeg data')

xlabel('Time(s)')

ylabel('Voltage(v)')

plot(Time\_d,emg1\_tr)

title('emg data')

xlabel('Time(s)')

ylabel('Voltage(v)')

eeg1\_tr\_fft=fft(eeg1\_tr);

eeg1\_tr\_fft(1)=0;

eeg1\_tr=ifft(eeg1\_tr\_fft);

plot(Time\_d,eeg1\_tr)

title('eeg data')

xlabel('Time(s)')

ylabel('Voltage(v)')

eeg1\_tr\_fft=fft(emg1\_tr);

eeg1\_tr\_fft(1)=0;

emg1\_tr=ifft(eeg1\_tr\_fft);

plot(Time\_d,emg1\_tr)

title('eeg data')

xlabel('Time(s)')

ylabel('Voltage(v)')

pspectrum(emg1\_tr,f\_data,"spectrogram","FrequencyLimits",[0,15],"MinThreshold",-40,"OverlapPercent",90,"TimeResolution",1.8);

pspectrum(eeg1\_tr,f\_data,"spectrogram","FrequencyLimits",[0,15],"MinThreshold",-50,"OverlapPercent",90,"TimeResolution",1.8);

% Smooth input data

eeg\_smooth = smoothdata(eeg1\_tr,"movmedian",[5 0]);

% Display results

clf

plot(eeg1\_tr,"Color",[77 190 238]/255,"DisplayName","Input data")

hold on

plot(eeg\_smooth,"Color",[0 114 189]/255,"LineWidth",1.5,...

"DisplayName","Smoothed data")

hold off

legend

% Remove trend from data

eeg\_smooth = detrend(eeg\_smooth,2);

% Display results

clf

plot(eeg\_smooth,"Color",[77 190 238]/255,"DisplayName","Input data")

hold on

plot(eeg\_smooth,"Color",[0 114 189]/255,"LineWidth",1.5,...

"DisplayName","Detrended data")

plot(eeg\_smooth-eeg\_smooth,"Color",[217 83 25]/255,"LineWidth",1,...

"DisplayName","Trend")

hold off

legend

% Smooth input data

emg\_smooth = smoothdata(emg1\_tr,"movmedian",[1 4]);

% Display results

clf

plot(emg1\_tr,"Color",[77 190 238]/255,"DisplayName","Input data")

hold on

plot(emg\_smooth,"Color",[0 114 189]/255,"LineWidth",1.5,...

"DisplayName","Smoothed data")

hold off

legend

% Remove trend from data

emg\_smooth = detrend(emg\_smooth);

% Display results

clf

plot(emg\_smooth,"Color",[77 190 238]/255,"DisplayName","Input data")

hold on

plot(emg\_smooth,"Color",[0 114 189]/255,"LineWidth",1.5,...

"DisplayName","Detrended data")

plot(emg\_smooth-emg\_smooth,"Color",[217 83 25]/255,"LineWidth",1,...

"DisplayName","Trend")

hold off

legend

pspectrum(eeg\_smooth,f\_data,"power","FrequencyLimits",[0,10])%"FrequencyLimits",[0,15],"MinThreshold",-40,"OverlapPercent",90,"TimeResolution",1);

pspectrum(emg\_smooth,f\_data,"spectrogram","FrequencyLimits",[0,15],"MinThreshold",-40,"OverlapPercent",99,"TimeResolution",1);

pspectrum(eeg\_smooth,f\_data,"spectrogram","FrequencyLimits",[0,15],"MinThreshold",-40,"OverlapPercent",99,"TimeResolution",1);

pspectrum(emg\_smooth,f\_data,"power","FrequencyLimits",[0,10])

[correlated\_eeg\_emg,lags]=crosscorr(eeg\_smooth,emg\_smooth);

plot(lags,correlated\_eeg\_emg);

output\_eeg\_emg\_6=[eeg1\_tr,emg1\_tr];

output\_eeg\_emg\_6\_smooth=[eeg\_smooth,emg\_smooth];

writematrix(output\_eeg\_emg\_6\_smooth,'D:\matlab\ymaps\_code\data\output\_eeg\_emg\_6\_smooth.csv');

writematrix(output\_eeg\_emg\_6,'D:\matlab\ymaps\_code\data\output\_eeg\_emg\_6.csv');