

```
%% Common
clear all
ltpda_startup
% server
%rserverDAQ = 'fb';
rserverDAQ = 'fb';
%rserverDAQ = '130.75.117.159';

%% Get reference
% !!! UTC TIMES !!!
tref='2011-11-17 22:23:00';
ch2='Cl:I00-MC_F_DQ'; %Response channel
nsecs_ref = 240;

plbsRes2 = plist('built-in', 'ndscclient', 'hostname', rserverDAQ, 'PORT', 8088, 'CHANNELS', ch2, 'NSECS', nsecs_ref, 'STARTTIMES', tref);
Res2 = ao(plbsRes2);
Res2fft=psd(Res2,plist('scale','ASD','win','kaiser','Nfft','30*fs')); %Response channel to project to == h during the reference
time

%% WFS1 pitch
nsecs_inj = 240;
ch1='Cl:I00-WFS1_PIT_OUT_DQ'; %Injection channel

tinj='2011-11-17 22:57:00';

plbsExc1 = plist('built-in', 'ndscclient', 'hostname', rserverDAQ, 'PORT', 8088, 'CHANNELS', ch1, 'NSECS', nsecs_inj, 'STARTTIMES', tref);
tinj);
plbsRes1 = plist('built-in', 'ndscclient', 'hostname', rserverDAQ, 'PORT', 8088, 'CHANNELS', ch2, 'NSECS', nsecs_inj, 'STARTTIMES', tref);
tinj);
plbsExc2 = plist('built-in', 'ndscclient', 'hostname', rserverDAQ, 'PORT', 8088, 'CHANNELS', ch1, 'NSECS', nsecs_ref, 'STARTTIMES', tref);

%Timeseries AO
Res1 = ao(plbsRes1);
Exc1 = ao(plbsExc1);
```

```
Exc2 = ao(plbsExc2);

%Resample to 256Hz (same as MC_F)
Exc1=resample(Exc1,plist('fsout',256));
Exc2=resample(Exc2,plist('fsout',256));

Res1fft=psd(Res1,plist('scale','ASD','win','Kaiser','Nfft','30*fs'));
Exc1fft=psd(Exc1,plist('scale','ASD','win','Kaiser','Nfft','30*fs'));
Exc2fft=psd(Exc2,plist('scale','ASD','win','Kaiser','Nfft','30*fs'));

%Calculate TF during injection
CouplingWFS1PIT =tfe(Exc1,Res1,plist('win','Kaiser','Nfft','30*fs'));
ProjectionWFS1PIT = CouplingWFS1PIT .* Exc2fft;
ProjectionWFS1PIT = ProjectionWFS1PIT.setYunits(plist('yunits','V Hz^(-1/2)'))

%Check coherence
iplot(cohere(Res1,Exc1,plist('Nfft','30*fs')),plist('LEGENDS',{'Coherence between injection and response'}));

%% WFS2 pitch
nsecs_inj = 240;
ch1='C1:IOO-WFS2_PIT_OUT_DQ'; %Injection channel

tinj='2011-11-17 23:13:00';

plbsExc1 = plist('built-in', 'ndsclient', 'hostname', 'rserverDAQ', 'PORT', 8088, 'CHANNELS', ch1, 'NSECS', nsecs_inj, 'STARTTIMES', tinj);
plbsRes1 = plist('built-in', 'ndsclient', 'hostname', 'rserverDAQ', 'PORT', 8088, 'CHANNELS', ch2, 'NSECS', nsecs_inj, 'STARTTIMES', tinj);
plbsExc2 = plist('built-in', 'ndsclient', 'hostname', 'rserverDAQ', 'PORT', 8088, 'CHANNELS', ch1, 'NSECS', nsecs_ref, 'STARTTIMES', tinj);
tref);

%Timeseries AO
Res1 = ao(plbsRes1);
Exc1 = ao(plbsExc1);
```

```
Exc2 = ao(plbsExc2);

%Resample to 256Hz (same as MC_F)
Exc1=resample(Exc1,plist('fsout',256));
Exc2=resample(Exc2,plist('fsout',256));

Reslfft=psd(Res1,plist('scale','ASD','win','Kaiser','Nfft','30*fs'));
Exclfft=psd(Exc1,plist('scale','ASD','win','Kaiser','Nfft','30*fs'));
Exc2fft=psd(Exc2,plist('scale','ASD','win','Kaiser','Nfft','30*fs'));

%Calculate TF during injection
CouplingWFS2PIT =tfe(Exc1,Res1,plist('win','Kaiser','Nfft','30*fs'));
ProjectionWFS2PIT = CouplingWFS2PIT .* Exc2fft;
ProjectionWFS2PIT = ProjectionWFS2PIT.setYunits(plist('yunits','V Hz^(-1/2)'))

%Check coherence
iplot(cohere(Res1,Exc1,plist('Nfft','30*fs')),plist('LEGENDS',{'Coherence between injection and response'}));

%% WFS1 YAW
nsecs_inj = 240;
ch1='Cl:I00-WFS1_YAW_OUT_DQ'; %Injection channel

tinj='2011-11-17 23:03:00';

plbsExc1 = plist('built-in', 'ndsclient', 'hostname', 'rserverDAQ', 'PORT', 8088, 'CHANNELS', ch1, 'NSECS', nsecs_inj, 'STARTTIMES', tinj);
plbsRes1 = plist('built-in', 'ndsclient', 'hostname', 'rserverDAQ', 'PORT', 8088, 'CHANNELS', ch2, 'NSECS', nsecs_inj, 'STARTTIMES', tinj);
plbsExc2 = plist('built-in', 'ndsclient', 'hostname', 'rserverDAQ', 'PORT', 8088, 'CHANNELS', ch1, 'NSECS', nsecs_ref, 'STARTTIMES', tinj);
tref);

%Timeseries AO
Res1 = ao(plbsRes1);
Exc1 = ao(plbsExc1);
Exc2 = ao(plbsExc2);
```

```
%Resample to 256Hz (same as MC_F)
Exc1=resample(Exc1,plist('fsout',256));
Exc2=resample(Exc2,plist('fsout',256));

Res1fft=psd(Res1,plist('scale','ASD','win','Kaiser','Nfft','30*fs'));
Exc1fft=psd(Exc1,plist('scale','ASD','win','Kaiser','Nfft','30*fs'));
Exc2fft=psd(Exc2,plist('scale','ASD','win','Kaiser','Nfft','30*fs'));

%Calculate TF during injection
CouplingWFS1YAW =tfe(Exc1,Res1,plist('win','Kaiser','Nfft','30*fs'));
ProjectionWFS1YAW = CouplingWFS1YAW .* Exc2fft;
ProjectionWFS1YAW = ProjectionWFS1YAW.setYunits(plist('yunits','V Hz^(-1/2)'))

%Check coherence
iplot(cohere(Res1,Exc1,plist('Nfft','30*fs')),plist('LEGENDS',{'Coherence between injection and response'}));

%% WFS2 YAW
nsecs_inj = 240;
ch1='C1:IOO-WFS2_YAW_OUT_DQ'; %Injection channel

tinj='2011-11-17 23:18:00';

plbsExc1 = plist('built-in', 'ndsclient', 'hostname', 'rserverDAQ', 'PORT', 8088, 'CHANNELS', ch1, 'NSECS', nsecs_inj, 'STARTTIMES', t);
tinj);
plbsRes1 = plist('built-in', 'ndsclient', 'hostname', 'rserverDAQ', 'PORT', 8088, 'CHANNELS', ch2, 'NSECS', nsecs_inj, 'STARTTIMES', t);
tinj);
plbsExc2 = plist('built-in', 'ndsclient', 'hostname', 'rserverDAQ', 'PORT', 8088, 'CHANNELS', ch1, 'NSECS', nsecs_ref, 'STARTTIMES', t);
tref);

%Timeseries AO
Res1 = ao(plbsRes1);
Exc1 = ao(plbsExc1);
Exc2 = ao(plbsExc2);
```

```
%Resample to 256Hz (same as MC_F)
Exc1=resample(Exc1,plist('fsout',256));
Exc2=resample(Exc2,plist('fsout',256));

Res1fft=psd(Res1,plist('scale','ASD','win','Kaiser','Nfft','30*fs'));
Exc1fft=psd(Exc1,plist('scale','ASD','win','Kaiser','Nfft','30*fs'));
Exc2fft=psd(Exc2,plist('scale','ASD','win','Kaiser','Nfft','30*fs'));

%Calculate TF during injection
CouplingWFS2YAW =tfe(Exc1,Res1,plist('win','Kaiser','Nfft','30*fs'));
ProjectionWFS2YAW = CouplingWFS2YAW .* Exc2fft;
ProjectionWFS2YAW = ProjectionWFS2YAW.setYunits(plist('yunits','V Hz^(-1/2)'))

%Check coherence
iplot(cohere(Res1,Exc1,plist('Nfft','30*fs')),plist('LEGENDS',{'Coherence between injection and response'}));

%% Plot stuff
%iplot(Res2fft)
sumuncorr=abs(ProjectionWFS1PIT).^2+abs(ProjectionWFS2PIT).^2+abs(ProjectionWFS1YAW).^2+abs(ProjectionWFS2YAW).^2;
sumuncorr=sqrt(sumuncorr);

iplot(Res2fft,abs(ProjectionWFS1PIT),abs(ProjectionWFS2PIT),abs(ProjectionWFS1YAW),abs(ProjectionWFS2YAW),sumuncorr,plist(
('LEGENDS',{'Reference','WFS1PIT','WFS2PIT','WFS1YAW','WFS2YAW','Sum of noise'},'XRANGES',{'All',[0.1 20]}))
```