

Filtros: Ahora es personal

Importar datos

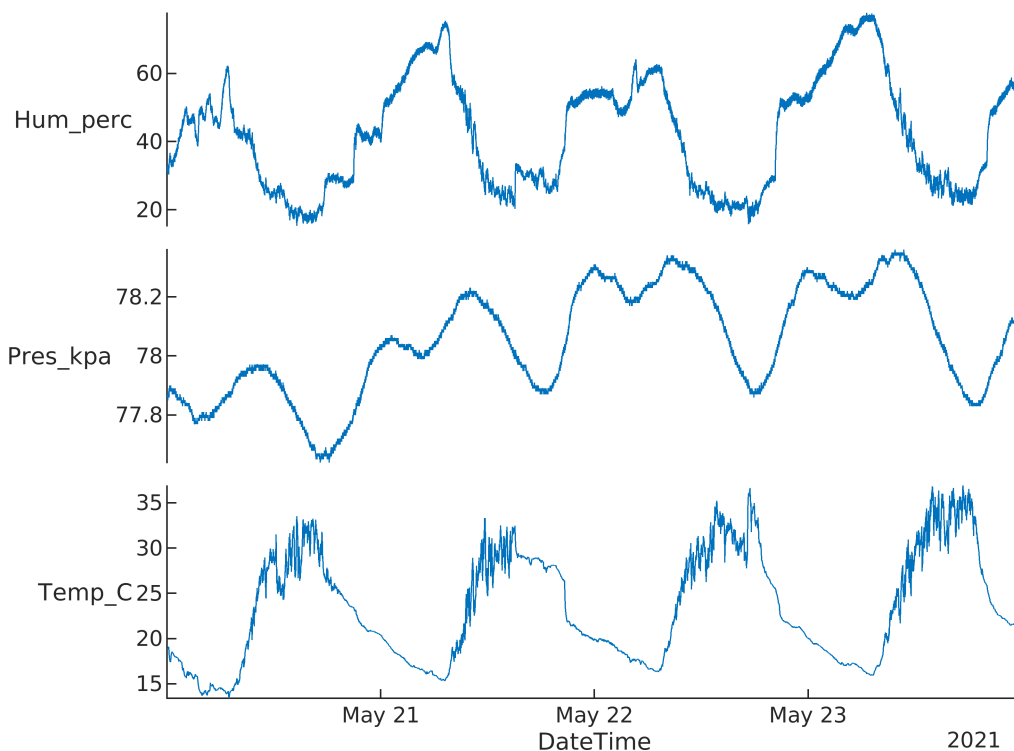
```
load("../Utils4SP/Datasets/S9_Filtros.mat");
```

Filtro Savitzky-Golay

- Aplicar S.G.
- Calcular los coeficientes y guardarlos
- Aplicar promedio móvil
- Comparar en tiempo y en frecuencia

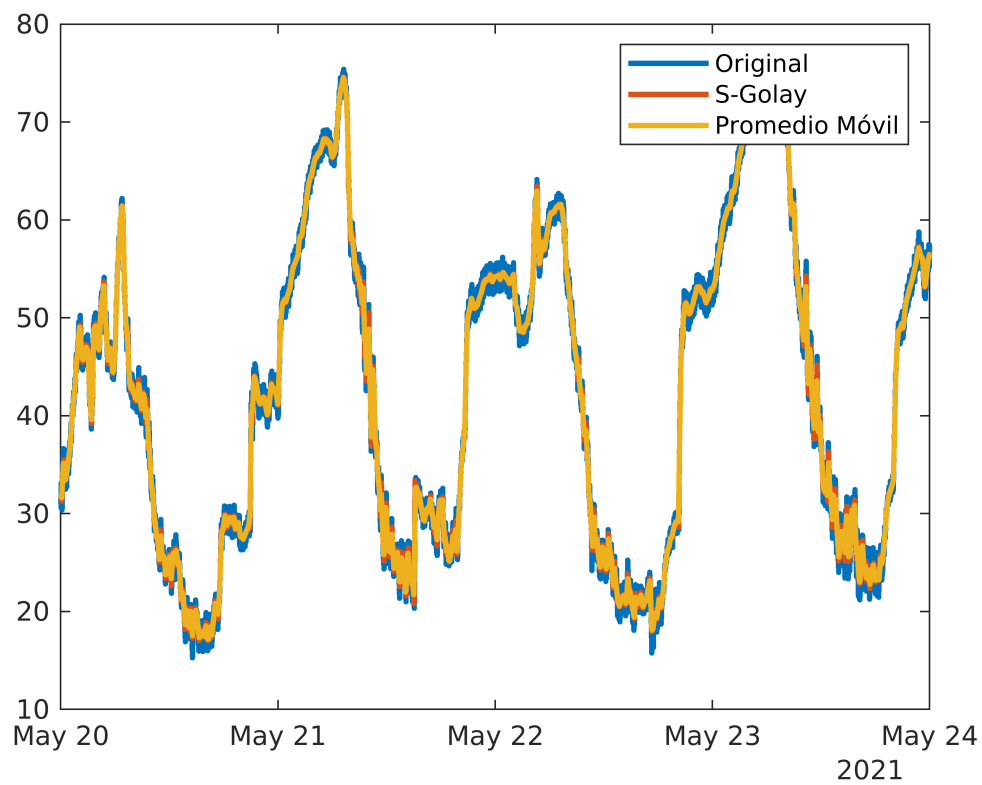
```
figure  
stackedplot(atmosfera(:,["DateTime" "Hum_perc" "Pres_kpa" "Temp_C"]), 'XVariable', "DateT
```

Warning: MATLAB has disabled some advanced graphics rendering features by switching to software OpenGL. For more information, click [here](#).

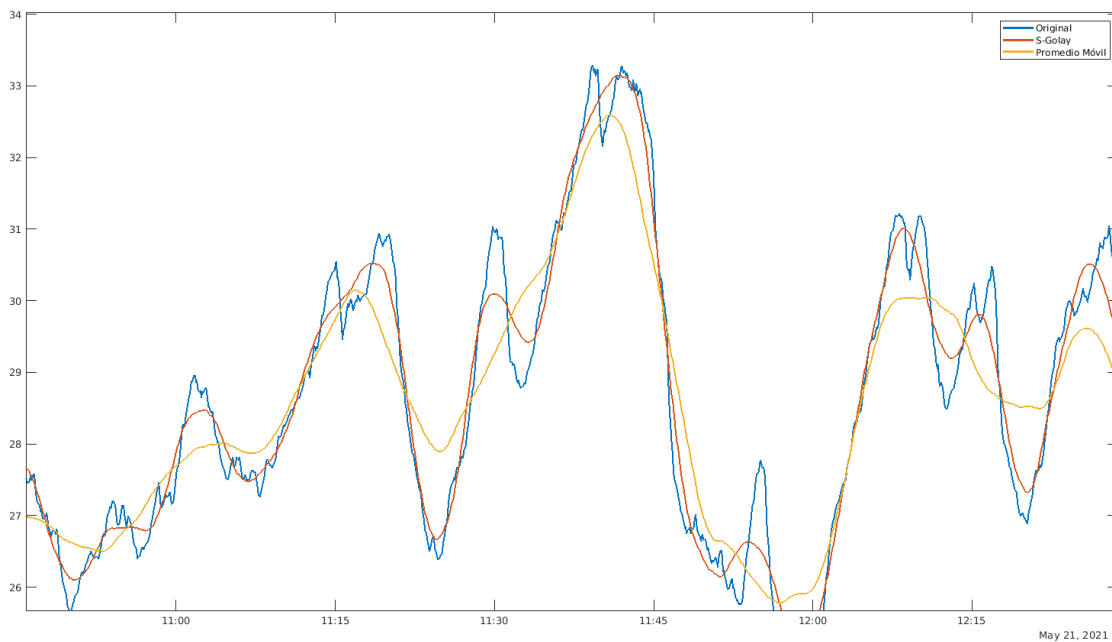
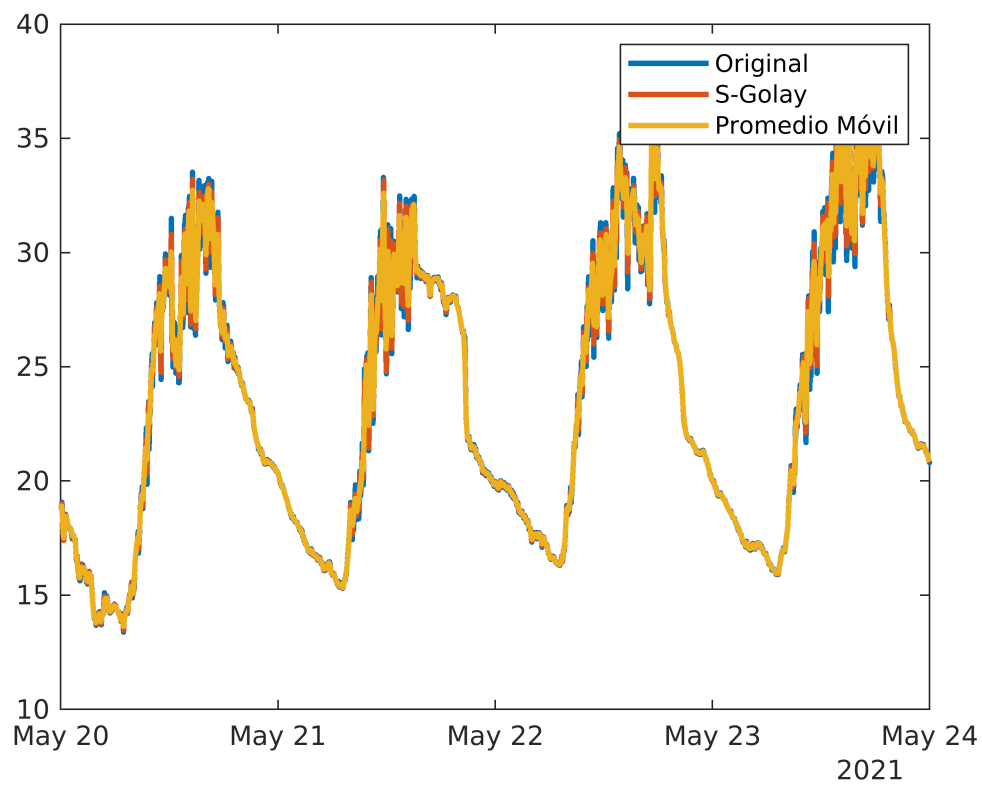


```
atmosfera_sg=sgolayfilt(atmosfera{:[ "Hum_perc" "Pres_kpa" "Temp_C" ]},2,101);  
atmosfera_movmean=movmean(atmosfera{:[ "Hum_perc" "Pres_kpa" "Temp_C" ]},101);
```

```
figure  
plot(atmosfera.DateTime,[atmosfera.Hum_perc atmosfera_sg(:,1) atmosfera_movmean(:,1)], 'b', 'r', 'g');  
legend("Original", "S-Golay", "Promedio Móvil")
```



```
figure
plot(atmosfera.DateTime,[atmosfera.Temp_C atmosfera_sg(:,3) atmosfera_movmean(:,3)], 'Line')
legend("Original", "S-Golay", "Promedio Móvil")
```



Acercamiento a las transiciones del campo de temperatura. Se observa que el filtro SGolay conserva los valles y picos, mientras que el promedio móvil los rechaza.

Diseño de filtros

- Diseñar filtros con designfilt
- Paso alto (FIR IIR) y paso bajo (FIR IIR)
- Visualizar con FV tool
- Sacarles los coeficientes con TF

Revisar el audio del buho con el espectrograma

- Rediseñar los filtros pasa altos y pasabajos para rechazar "Unas señales"
- Visualizar el audio del buho filtrado

```
low_pass=designfilt;
```

```
designfilt('lowpassfir','PassbandFrequency',0.45,'StopbandFrequency',0.55,'PassbandRipple',0.1,'StopbandAt
```

```
high_pass=designfilt;
```

```
designfilt('highpassfir','StopbandFrequency',0.45,'PassbandFrequency',0.55,'StopbandAttenuation',60,'Passb
```

Visualizacion de filtros

```
%fvtool(low_pass)
%fvtool(high_pass)
LP_coeff=tf(low_pass);
HP_coeff=tf(high_pass);
```

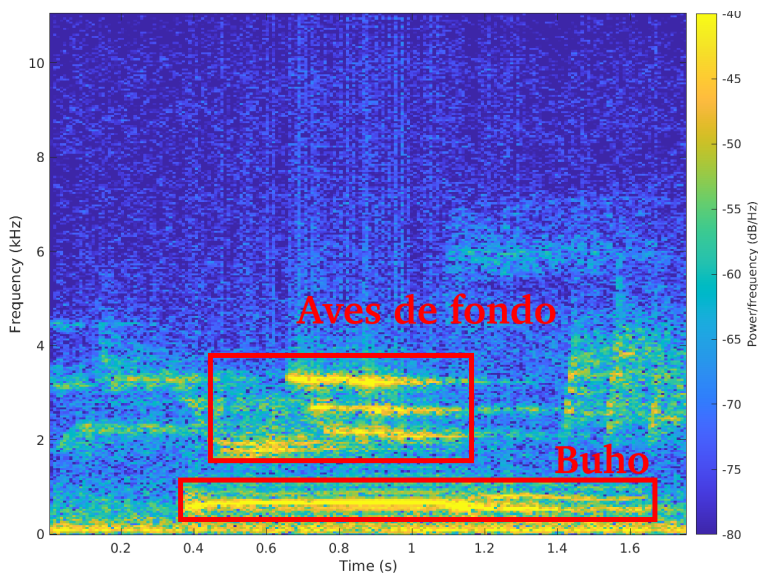
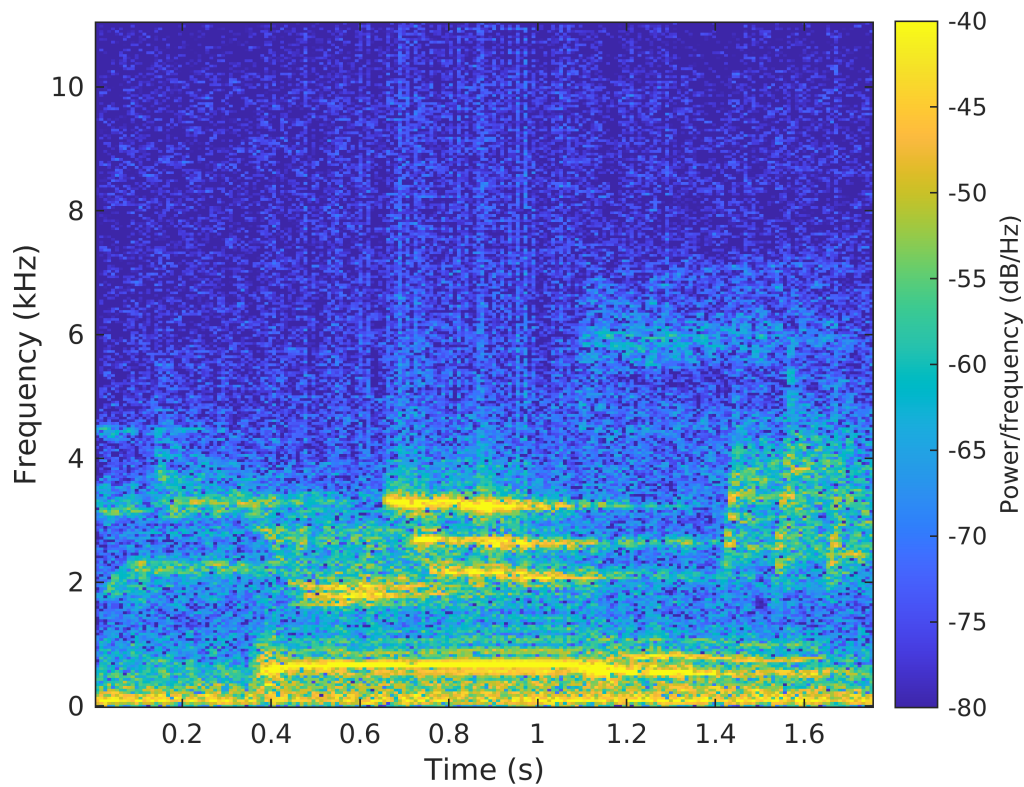
Mirar al buho

```
buho_ch1=buho(:,1);
N_spec=numel(buho_ch1)/100;

spectrogram(buho_ch1,rectwin(N_spec),[],[],fs_buho,'yaxis')
```

Warning: Rounding order to nearest integer.

```
caxis([-80 -40])
```



- Hacer un paso alto para quitar al buho
- Hacer un paso bajo para quitar a las aves

```
high_pass_buho=designfilt;
```

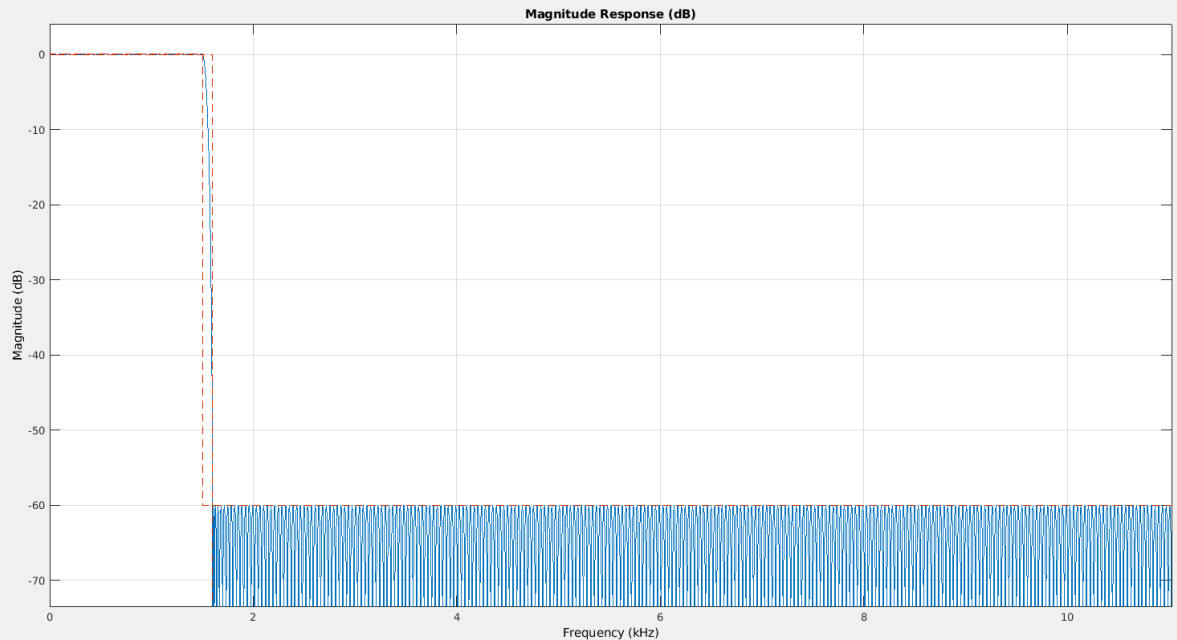
```
designfilt('highpassfir','StopbandFrequency',1500,'PassbandFrequency',1600,'StopbandAttenuation',60,'Passb
```

```
low_pass_buho=designfilt;
```

```
designfilt('lowpassfir','PassbandFrequency',1500,'StopbandFrequency',1600,'PassbandRipple',0.1,'StopbandAt
```

Visualizacion

```
fvtool(high_pass_buho)
fvtool(low_pass_buho)
```



Filtrar la señal del buho con los filtros previos

Usar filter

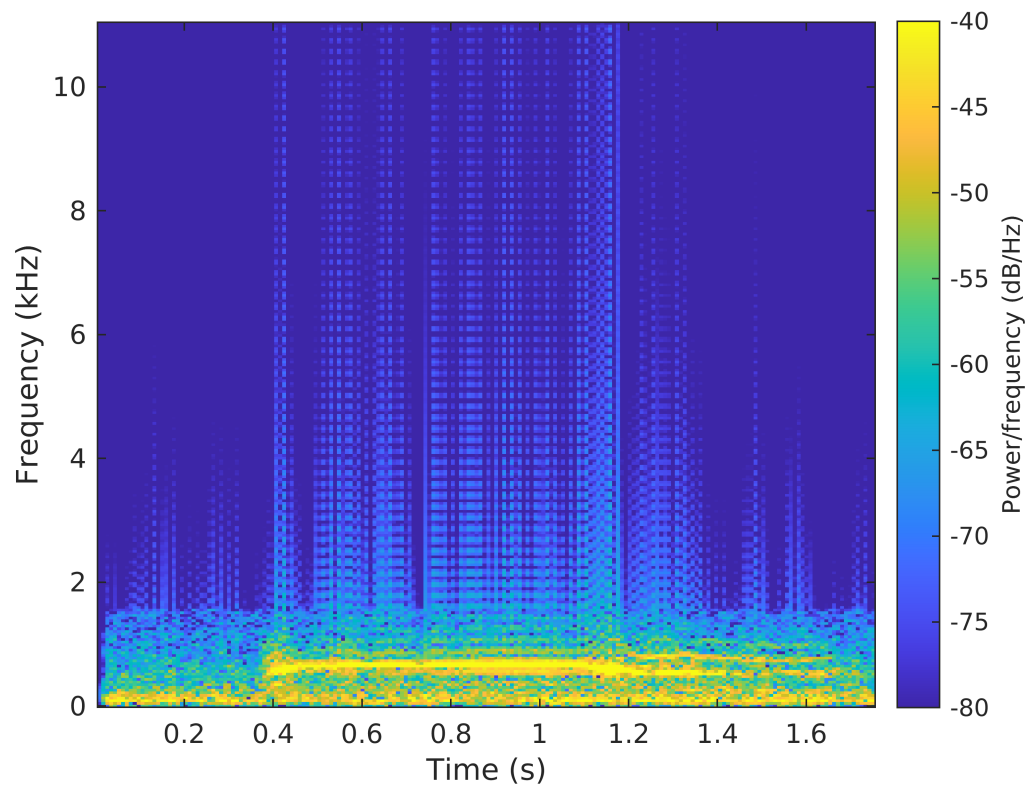
```
buho_LP=filter(low_pass_buho,buho_ch1);
buho_HP=filter(high_pass_buho,buho_ch1);
```

Visualización antes y después del filtrado

```
figure
spectrogram(buho_LP,rectwin(N_spec),[],[],fs_buho,'yaxis')
```

Warning: Rounding order to nearest integer.

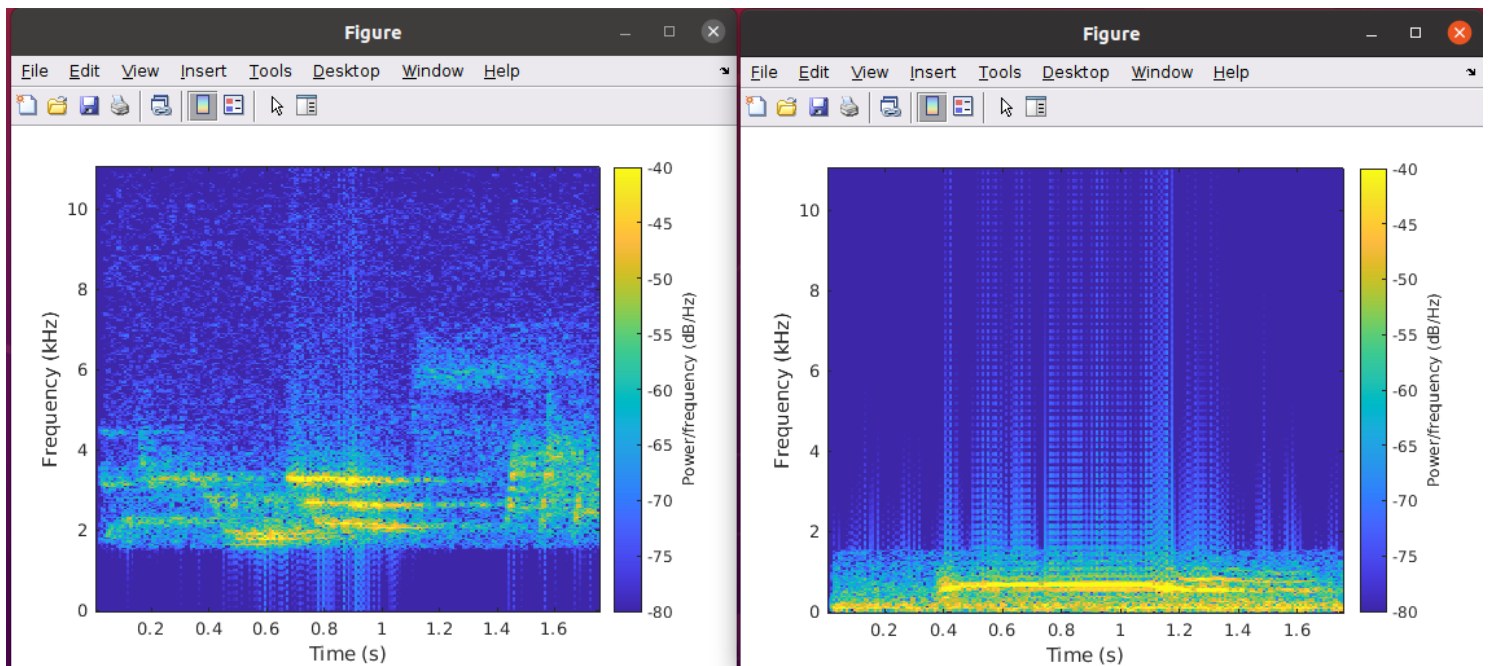
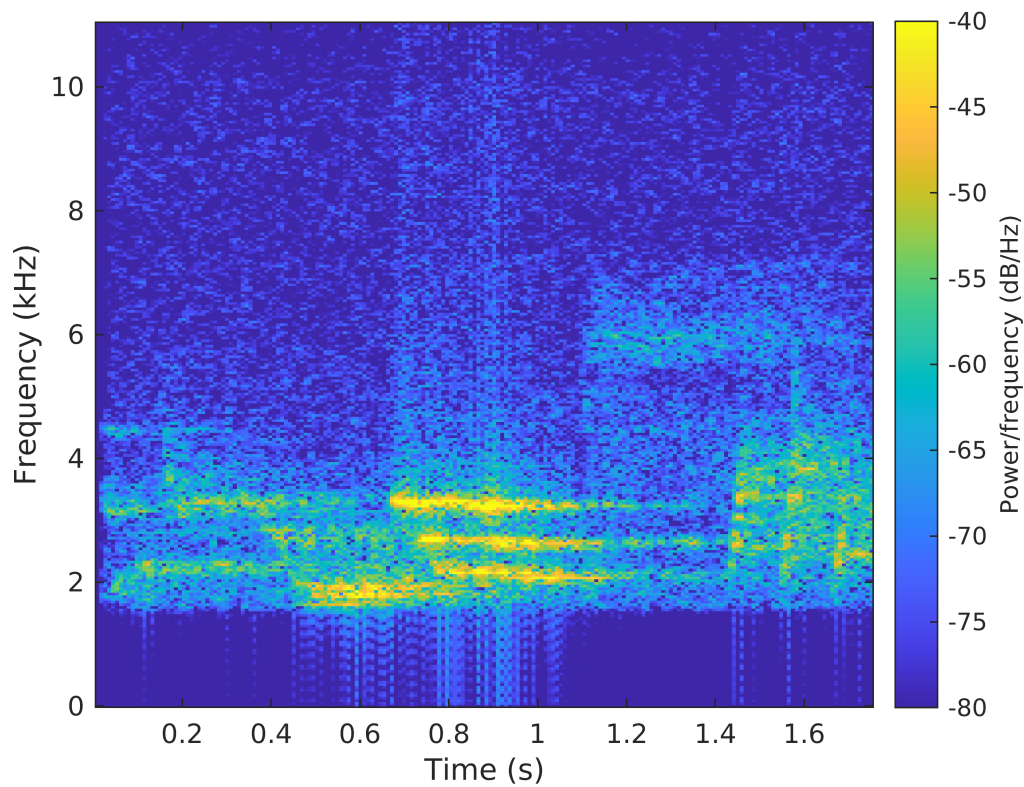
```
caxis([-80 -40])
```



```
figure  
spectrogram(buho_HP,rectwin(N_spec),[],[],fs_buho,'yaxis')
```

Warning: Rounding order to nearest integer.

```
caxis([-80 -40])
```



Izquierda: Filtro paso alto que elimina al buho// Derecha: Filtro paso bajo que elimina a las aves de fondo.

Escuchar

```
sound(buho_HP, fs_buho)
```



```
sound(buho_LP,fs_buho)
```