

PJI - acelerometro

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Bibliotecas

```
library(ggplot2)
library(dygraphs)
library(dplyr)
library(patchwork)
```

Módulo 1

Importando arquivos

```
df1_controle <- read.table("Grupo3 Acelerometro Controle.txt", header = TRUE, sep = "\t")
df1_problema <- read.table("Grupo3 Acelerometro Problema Motor.txt", header = TRUE, sep = "\t")
```

Conversão de dados

```
#Convertendo o separador decimal de ',' para '.'
df1_controle <- as.data.frame(lapply(df1_controle, function(x) as.numeric(gsub(",", ".", x))))

df1_problema <- as.data.frame(lapply(df1_problema, function(x) as.numeric(gsub(",", ".", x))))

#Convertendo DataFrame para classe numérica
df1_controle[] <- lapply(df1_controle, as.numeric)
df1_problema[] <- lapply(df1_problema, as.numeric)
```

Plotando sinal

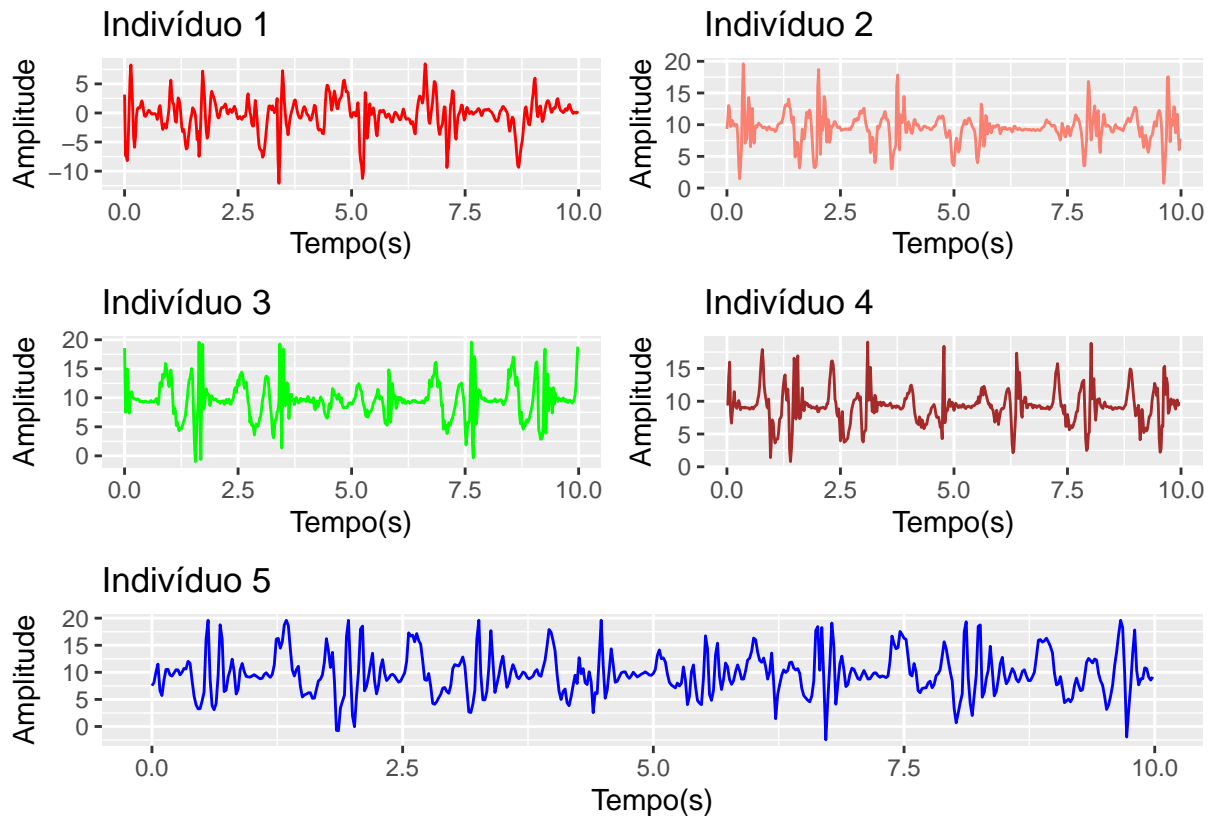
```
plot_controle_C1 <- ggplot2::ggplot() + geom_line(data = df1_controle, aes(x = Tempo, y = C1), color = 
plot_controle_C2 <- ggplot2::ggplot() + geom_line(data = df1_controle, aes(x = Tempo, y = C2), color = 
plot_controle_C3 <- ggplot2::ggplot() + geom_line(data = df1_controle, aes(x = Tempo, y = C3), color =
```

```

plot_controle_C4 <- ggplot2::ggplot() + geom_line(data = df1_controle, aes(x = Tempo, y = C4), color = 
plot_controle_C5 <- ggplot2::ggplot() + geom_line(data = df1_controle, aes(x = Tempo, y = C5), color = 

(plot_controle_C1 | plot_controle_C2)/
(plot_controle_C3 | plot_controle_C4)/
(plot_controle_C5)

```



```

for (col in names(df1_problema)[-1]) {
  # Criar um gráfico para cada coluna
  dygraph(data.frame(time = df1_problema$Tempo, value = df1_problema[[col]]), main = paste("Gráfico de"
  dyAxis("x", label = "Tempo (s)") |>
  dyAxis("y", label = "Amplitude") |>
  dyRangeSelector(dateWindow = c()) |> dyCSS(textConnection(" .dygraph-title{color : black;}")) |>
  print() # Para visualizar os gráficos no console do R
}

```

Observando espectro do sinal

```

fft_signal <- function(time, signal, name){
  dt <- time[2] - time[1] #Resolução temporal
  fs <- 1/dt #Frequência

```

```

rfs <- fs/length(time) #Resolução de frequência
final_frequency <- (length(time)-1) * rfs #Frequência final
ff <- seq(from = 0, to = final_frequency, by = rfs) #Vetor de frequência
signal_fft <- fft(signal) #Transformada de Fourier
signal_mag <- Mod(signal_fft) #Magnitude do sinal
signal_theta <- atan2(Im(signal_fft), Re(signal_fft)) #Fase do sinal

plot_mag <- ggplot2::ggplot(data.frame(ff, signal_mag)) + geom_line(aes(x = ff, y = signal_mag), color = "green")

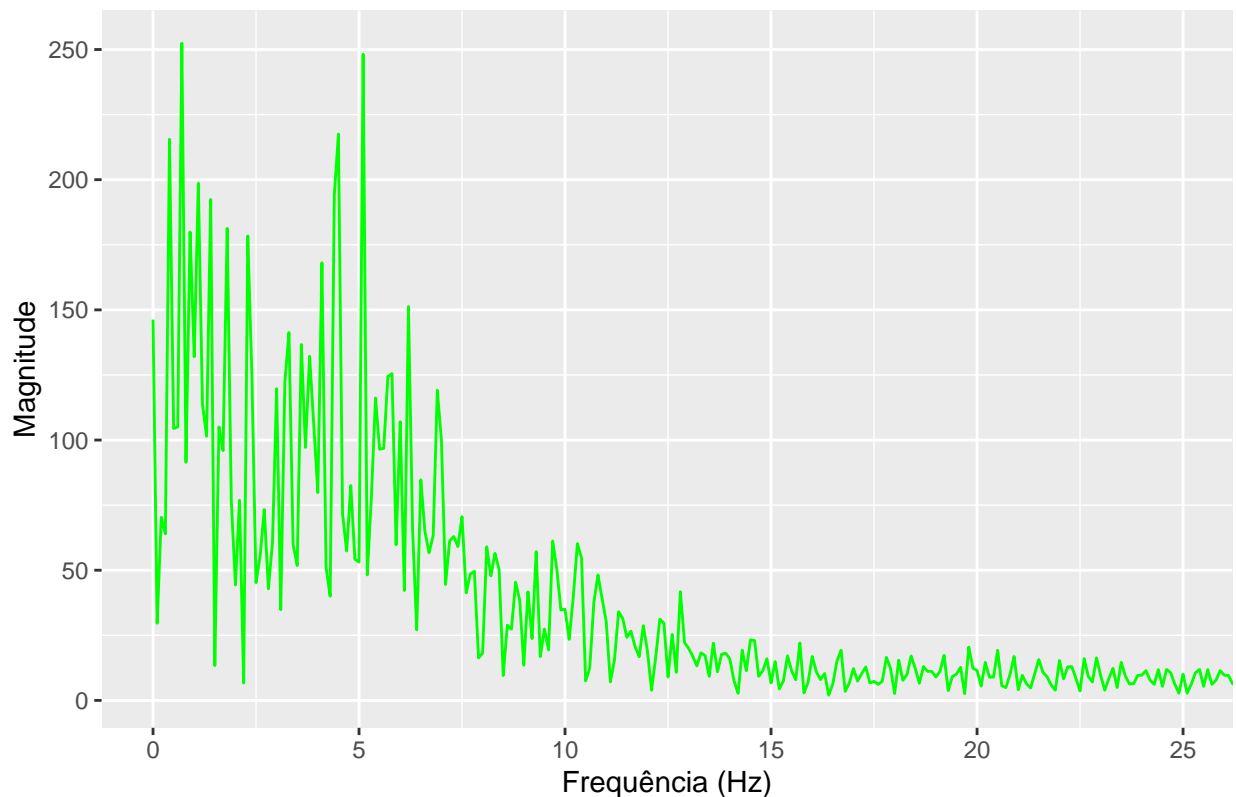
#plot_theta <- ggplot2::ggplot(data.frame(ff, signal_theta)) + geom_line(aes(x = ff, y = signal_theta), color = "red")

print(plot_mag)
#print(plot_theta)
}

#Amplitude do sinal grupo controle
fft_signal(df1_controle$Tempo, df1_controle$C1, "(grupo controle C1)")

```

Espectro de amplitude do sinal (grupo controle C1)

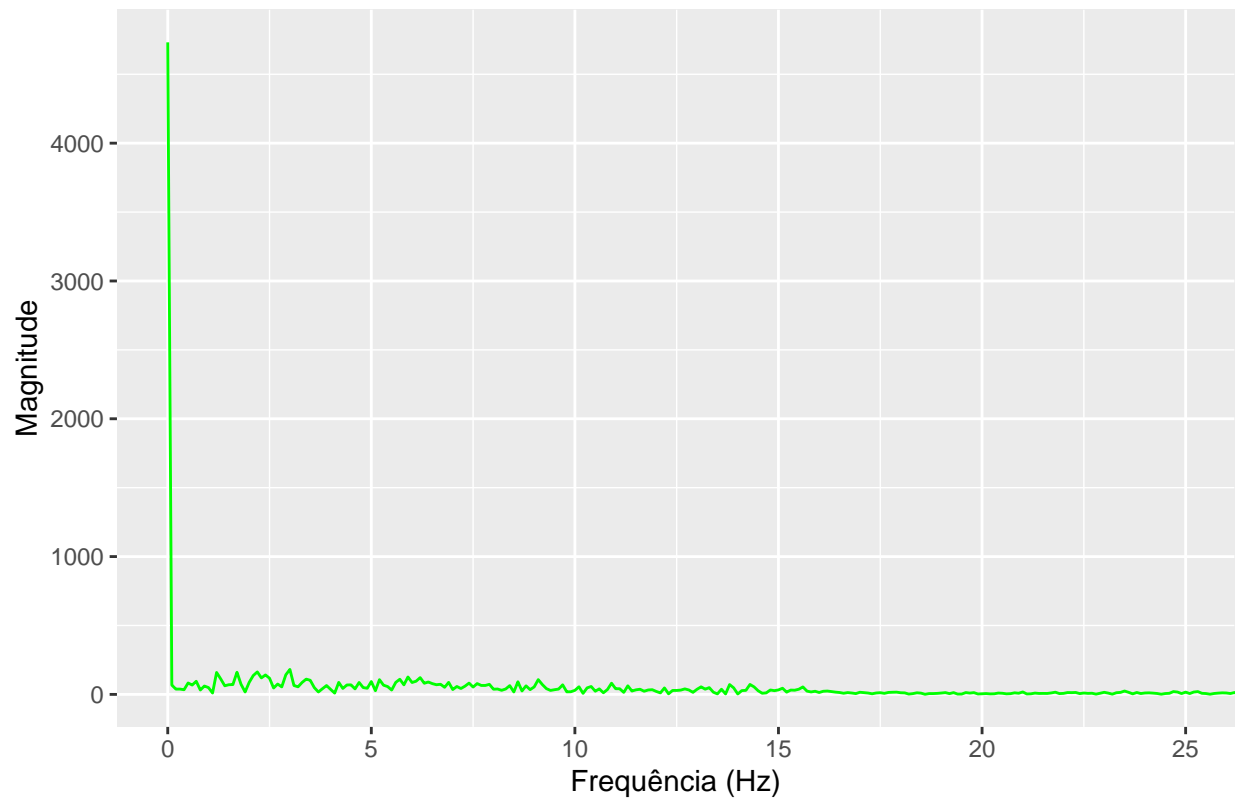


```

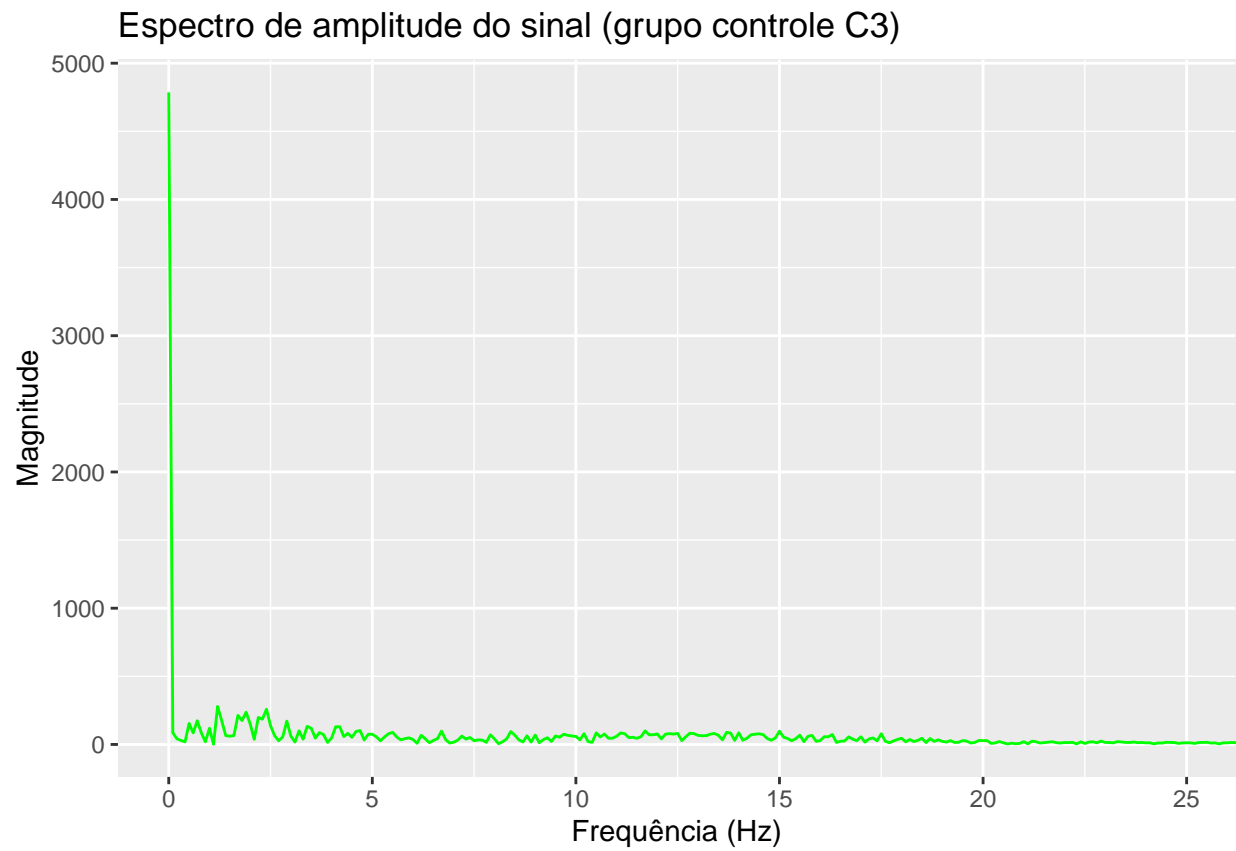
fft_signal(df1_controle$Tempo, df1_controle$C2, "(grupo controle C2)")

```

Espectro de amplitude do sinal (grupo controle C2)

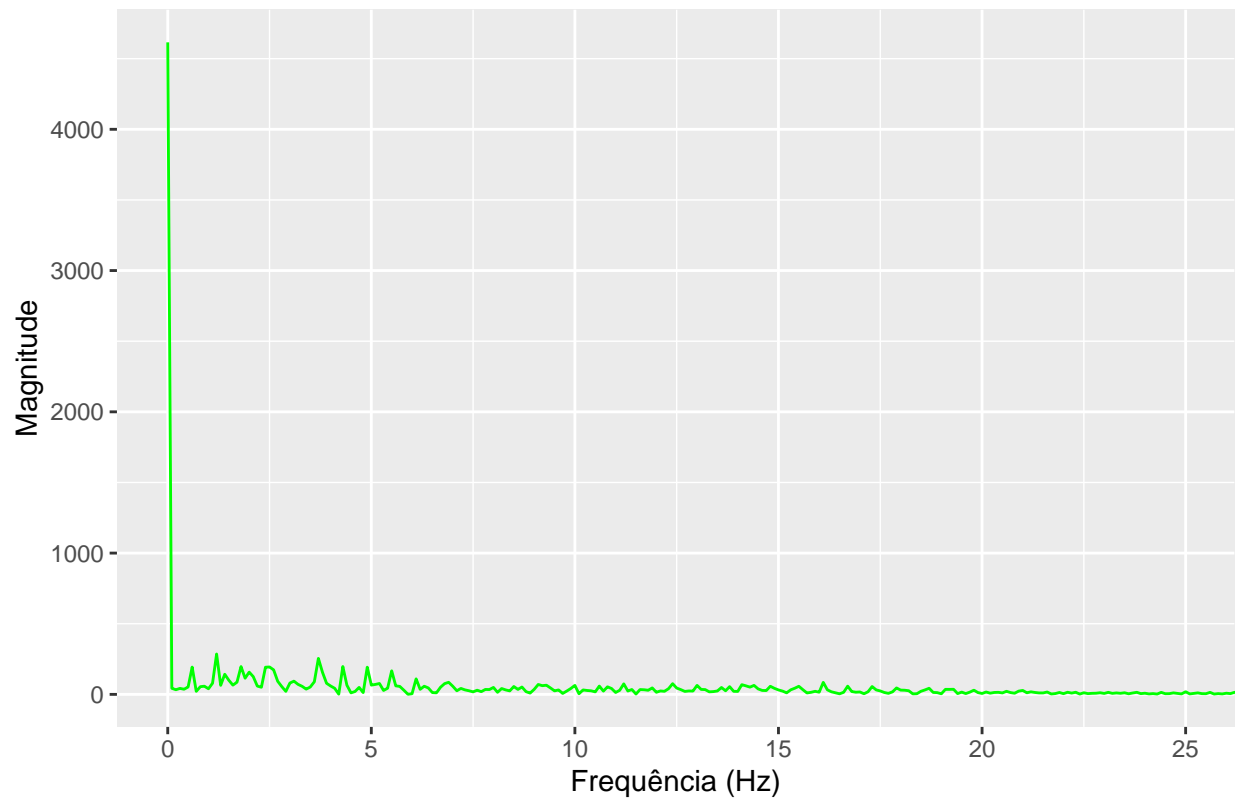


```
fft_signal(df1_controle$Tempo, df1_controle$C3, "(grupo controle C3)")
```



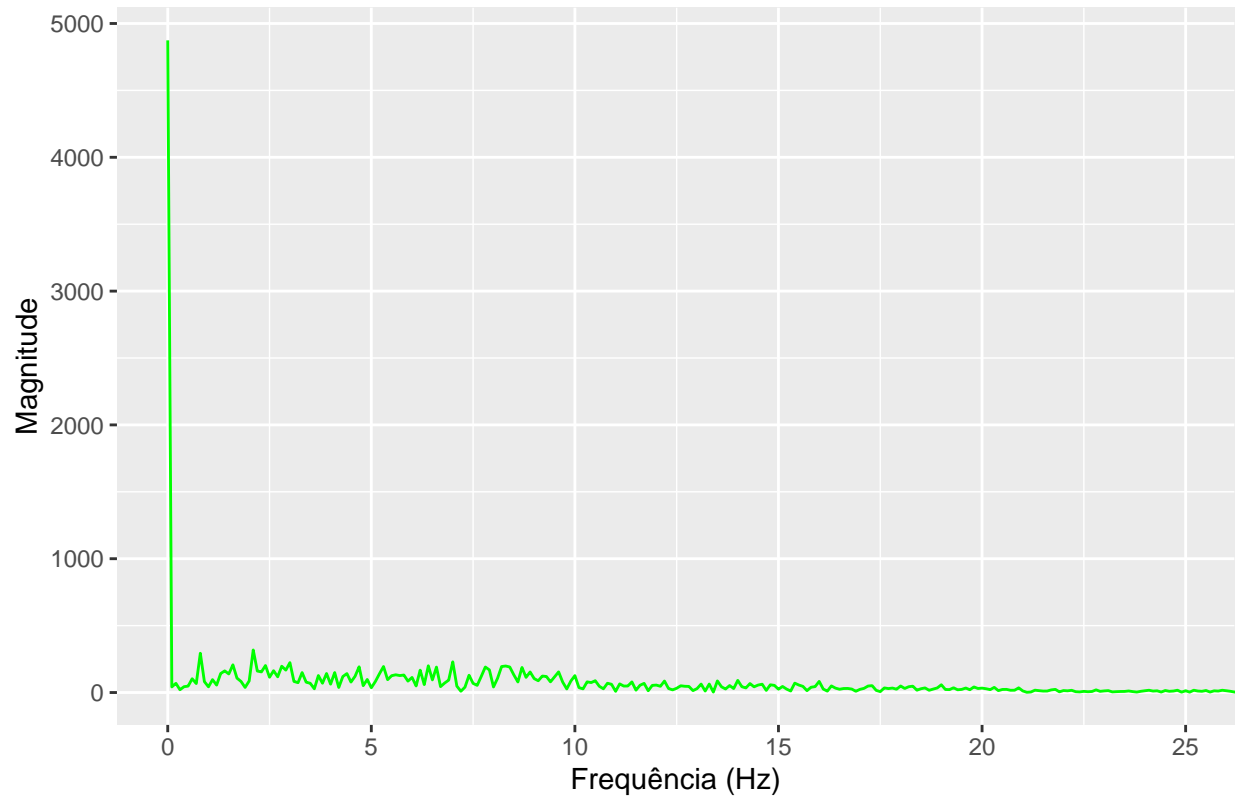
```
fft_signal(df1_controle$Tempo, df1_controle$C4, "(grupo controle C4)")
```

Espectro de amplitude do sinal (grupo controle C4)



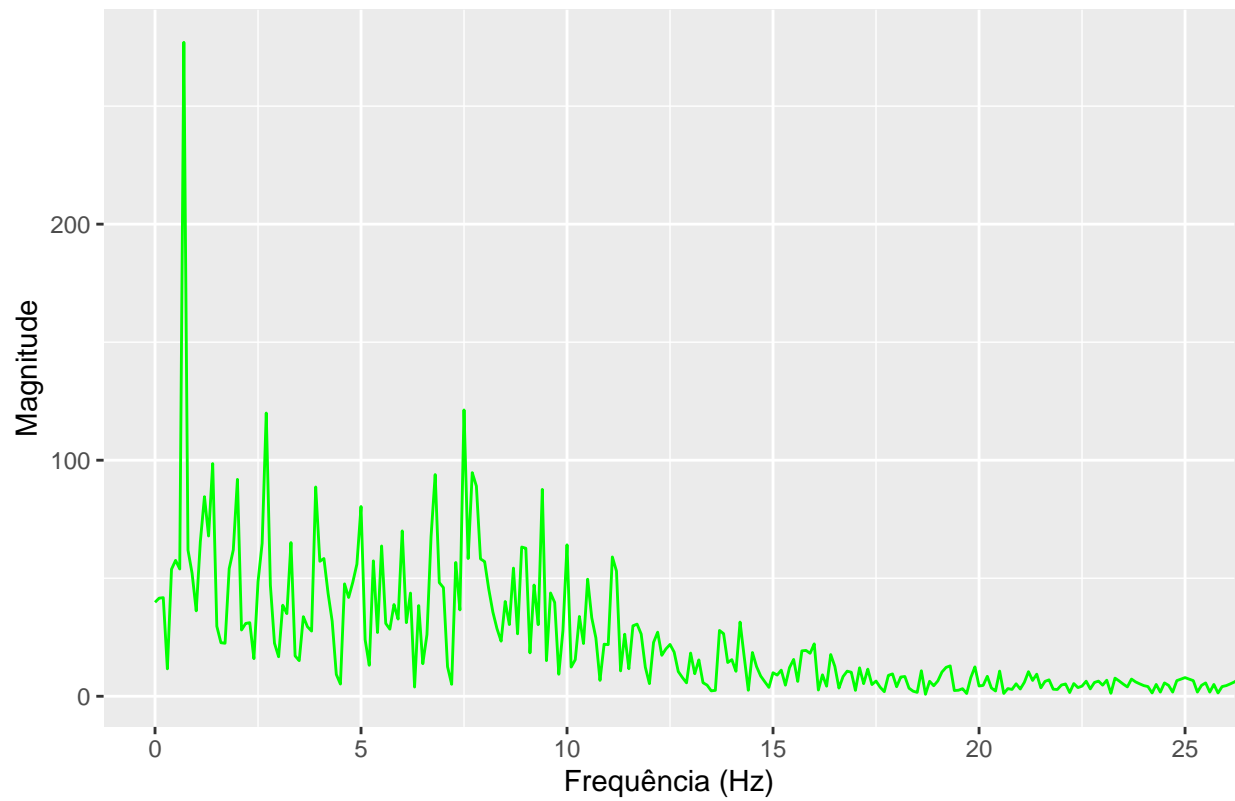
```
fft_signal(df1_controle$Tempo, df1_controle$C5, "(grupo controle C5)")
```

Espectro de amplitude do sinal (grupo controle C5)



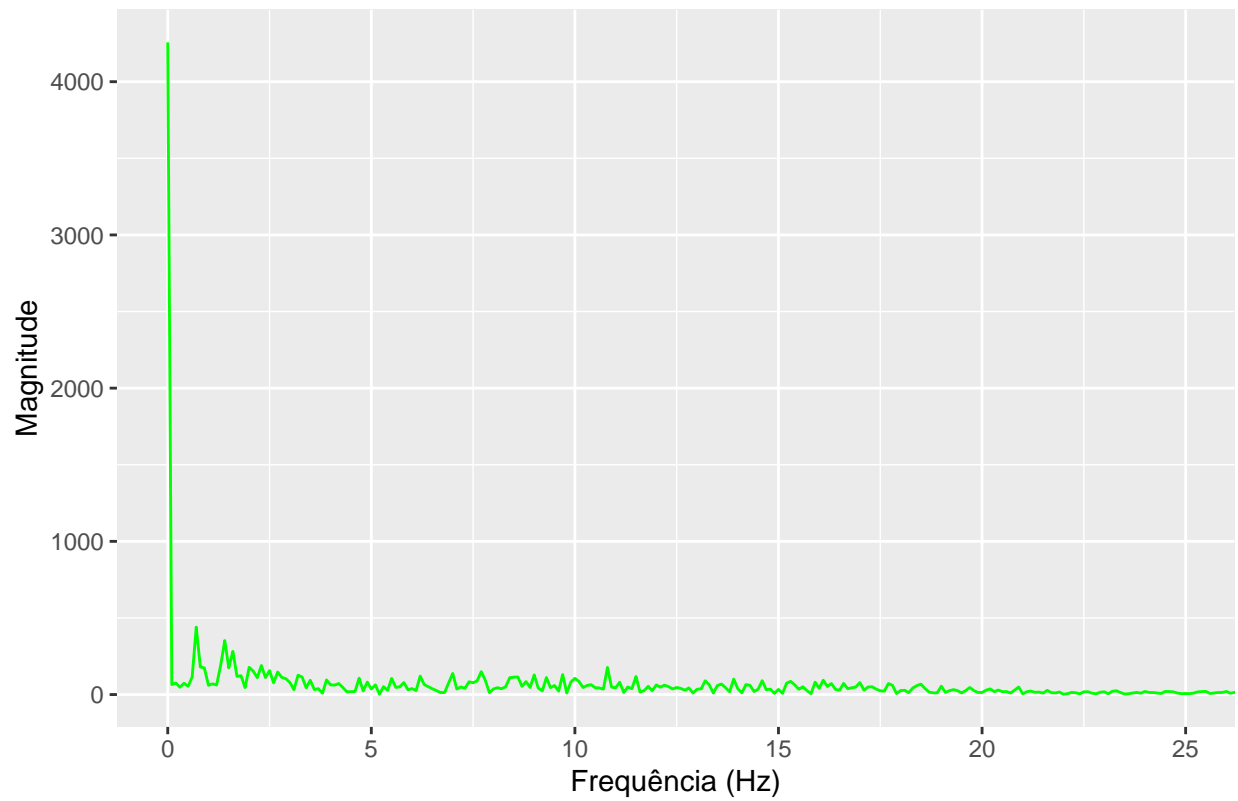
```
#Amplitude do sinal grupo problema motor  
fft_signal(df1_problema$Tempo, df1_problema$DP1, "(grupo problema motor DP1)")
```

Espectro de amplitude do sinal (grupo problema motor DP1)



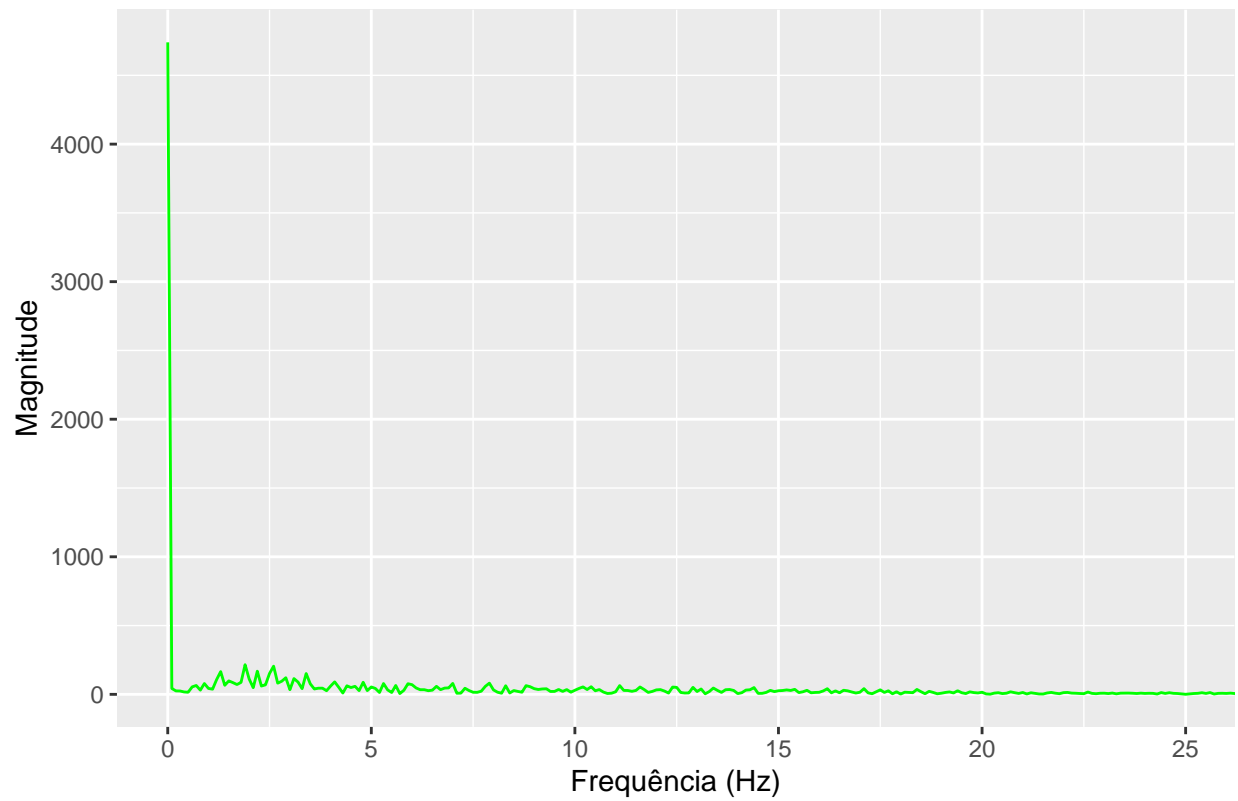
```
fft_signal(df1_problema$Tempo, df1_problema$DP2, "(grupo problema motor DP2)")
```


Espectro de amplitude do sinal (grupo problema motor DP2)



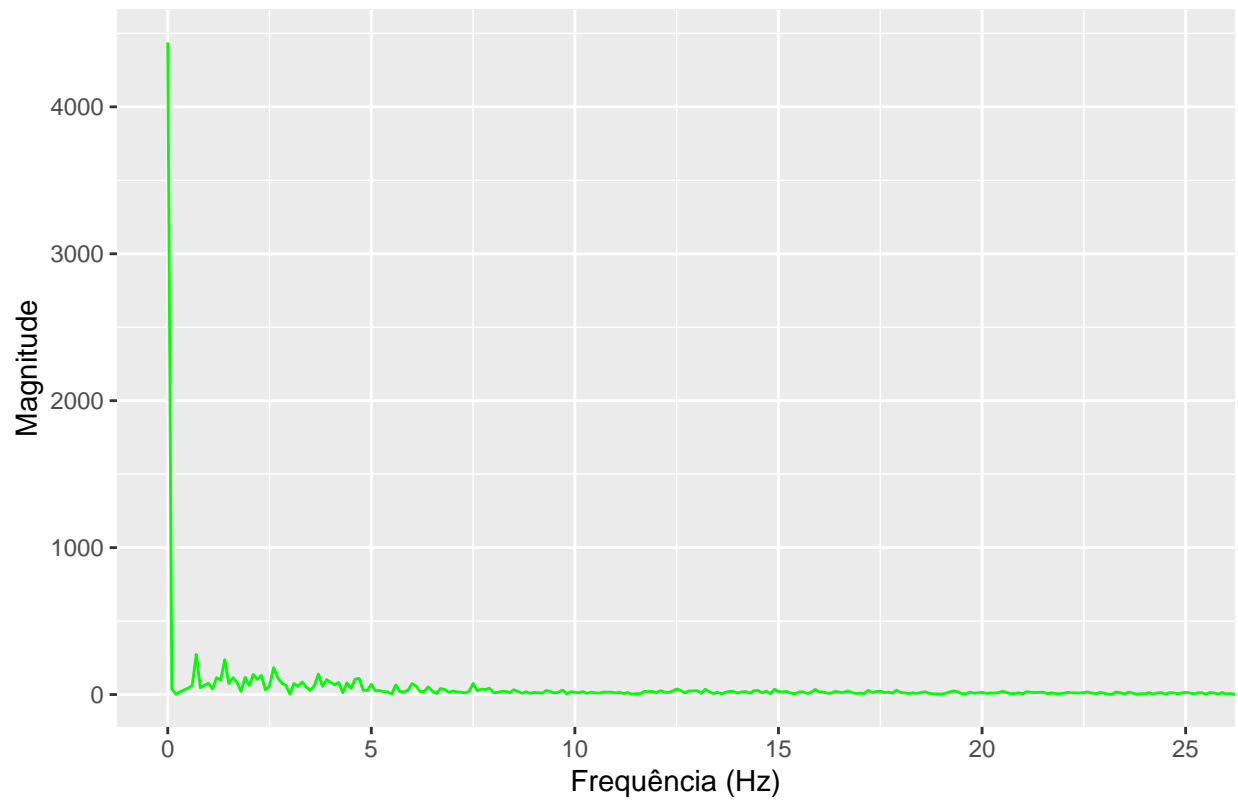
```
fft_signal(df1_problema$Tempo, df1_problema$DP3, "(grupo problema motor DP3)")
```

Espectro de amplitude do sinal (grupo problema motor DP3)



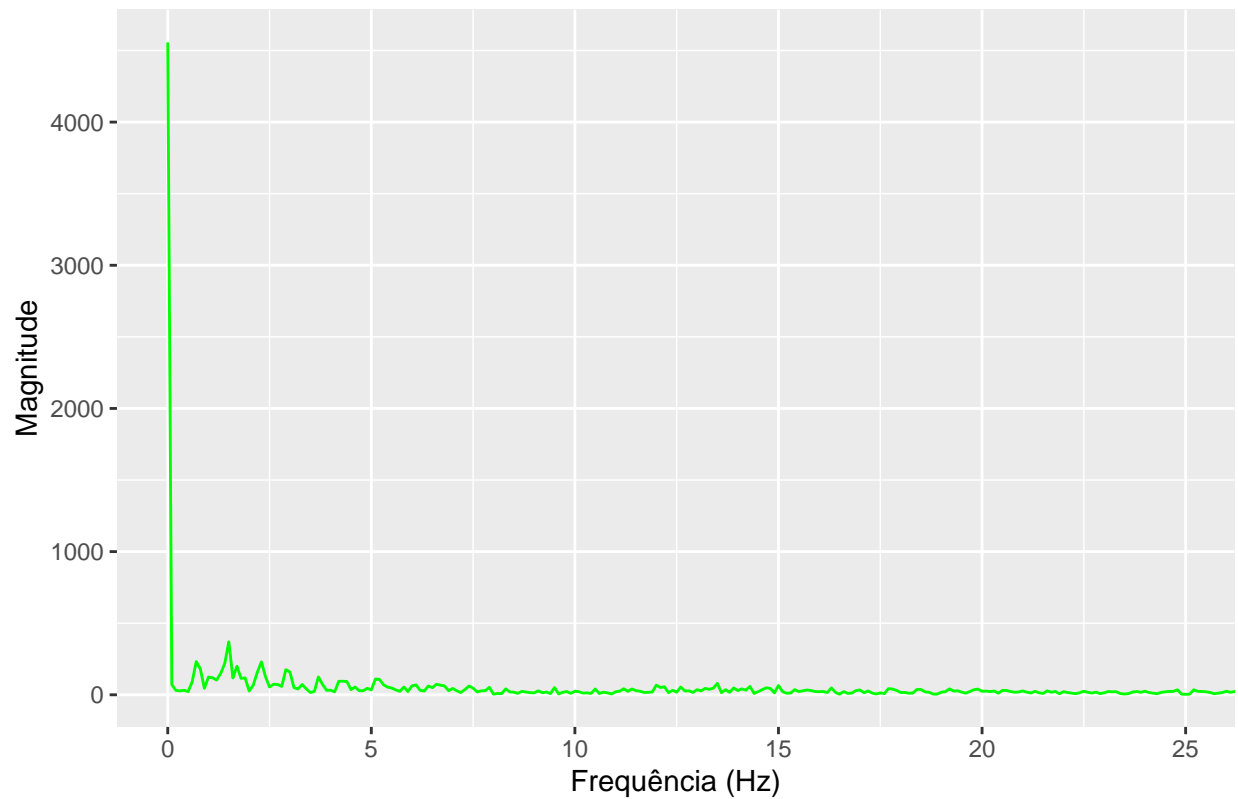
```
fft_signal(df1_problema$Tempo, df1_problema$DP4, "(grupo problema motor DP4)")
```

Espectro de amplitude do sinal (grupo problema motor DP4)



```
fft_signal(df1_problema$Tempo, df1_problema$DP5, "(grupo problema motor DP5)")
```

Espectro de amplitude do sinal (grupo problema motor DP5)



Cálculo de amplitude MAV - Mean Absolute Value

Cálculo de frequência - F80

Cálculo estatístico - Diferença interquartil