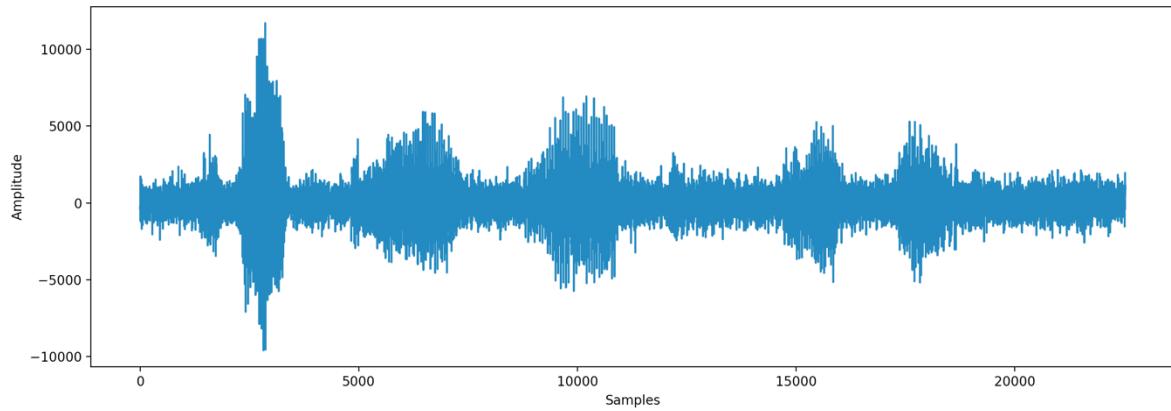
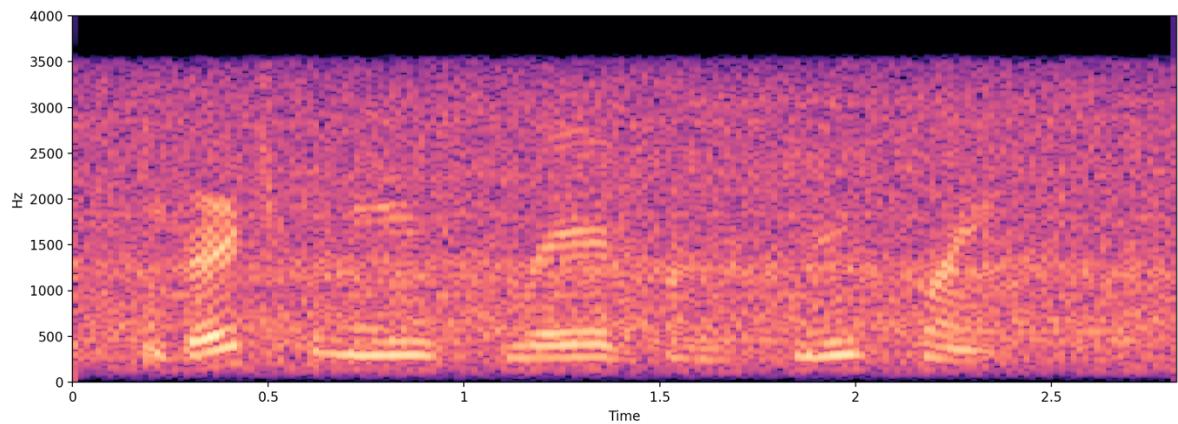


Task 7.2C

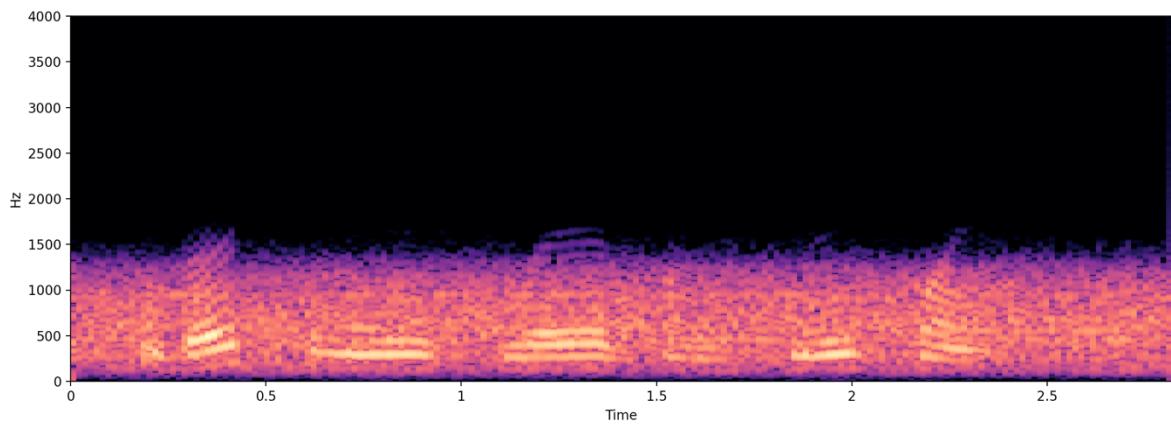
Noisy_s visualization



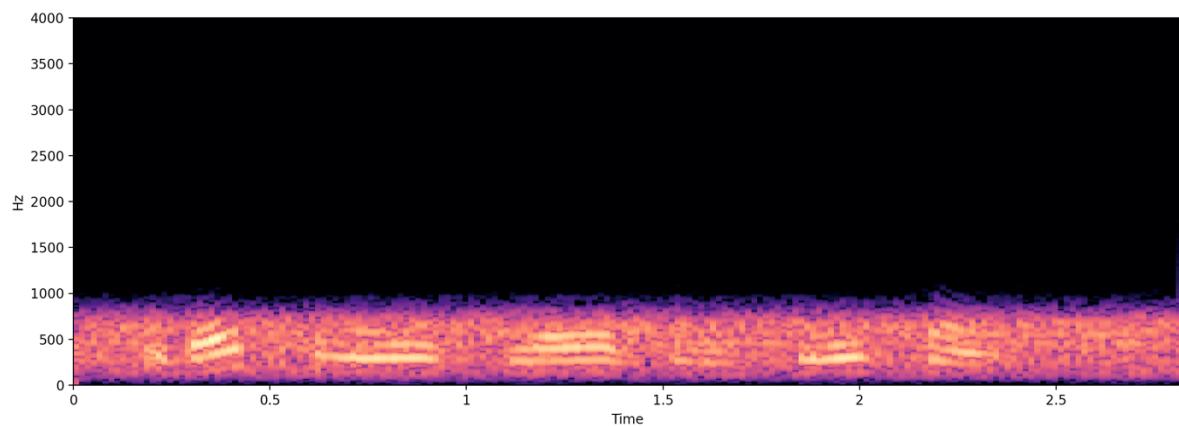
Spectrogram for Noisy_s



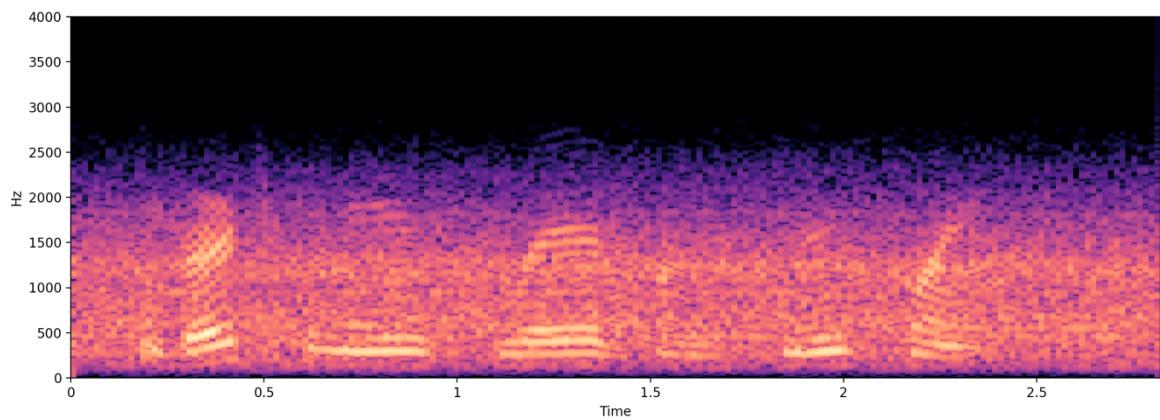
Low_pass filter for Noisy_s



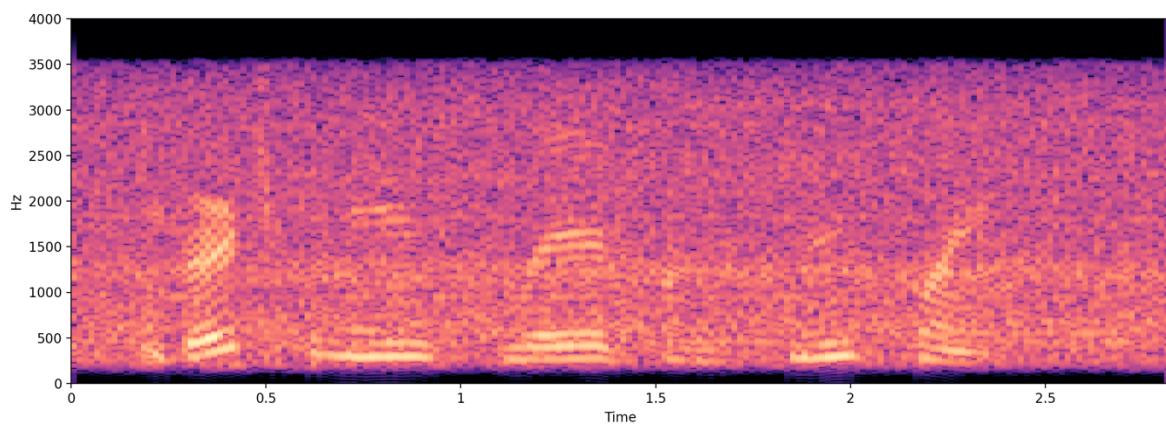
Low_pass filter for Noisy_s --- order: 10, cut_off_frequency: 700



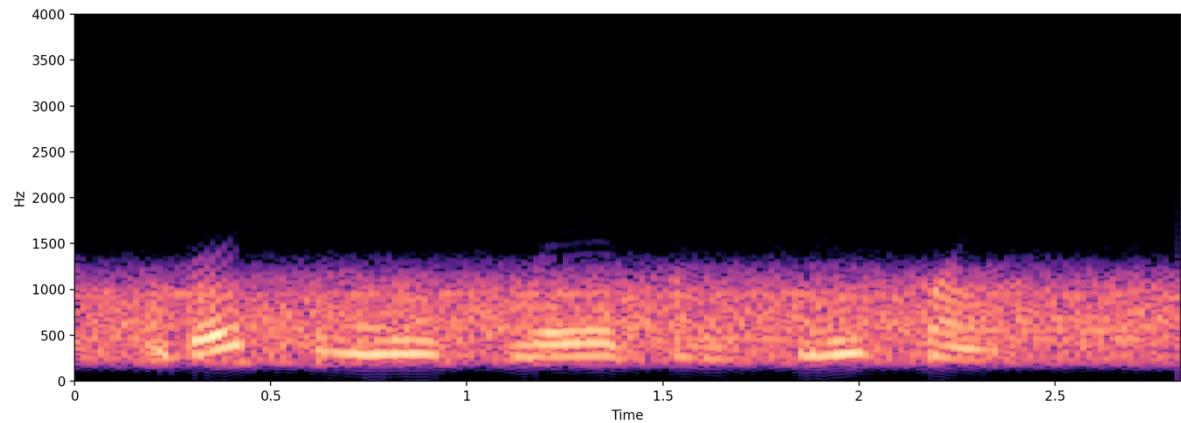
Low_pass filter for Noisy_s --- order:5, cut_off_frequency: 1500



Highpass filter



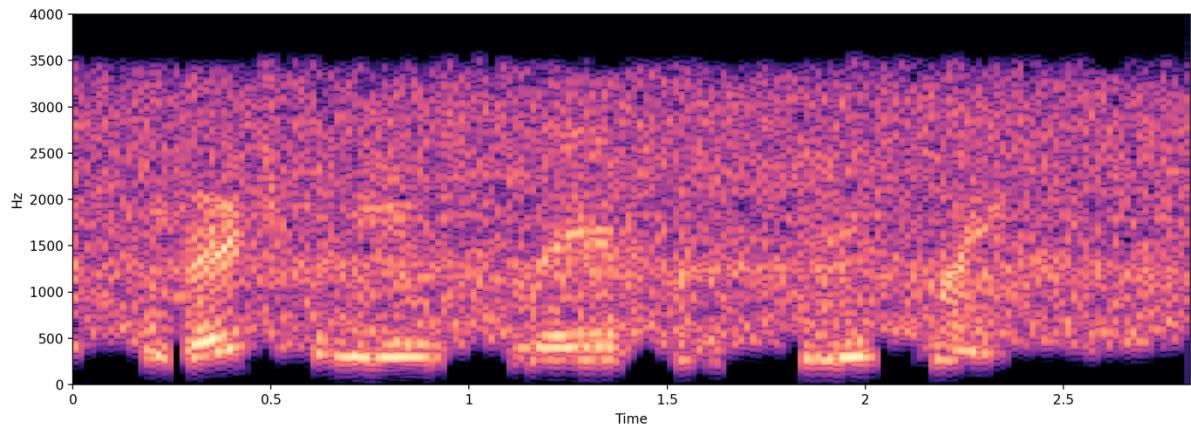
Bandpass filter



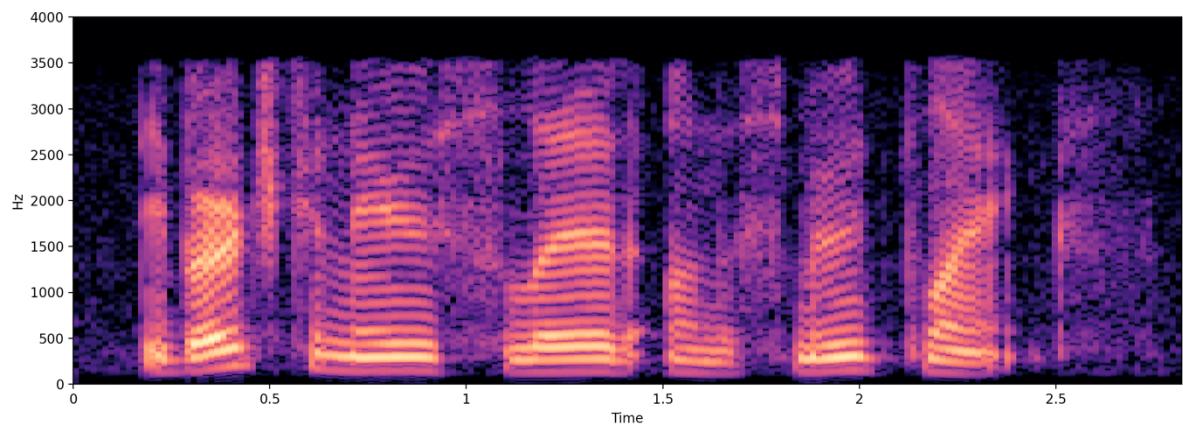
Quality of sp01_station_sn5_spectralsubtraction.wav

The speech can be heard but it was muffled and the distortion in the speech was significant.

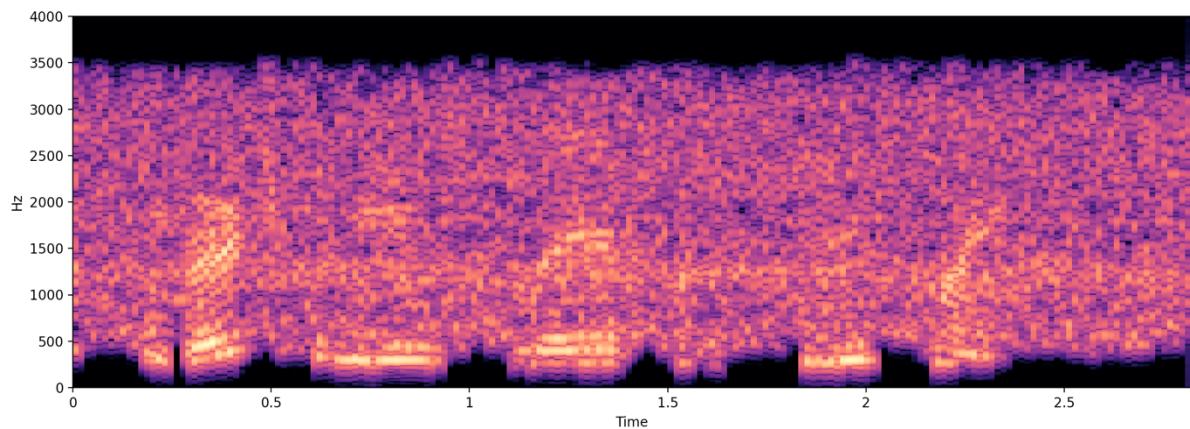
Spectrogram of sp01_station_sn5_spectralsubtraction.wav



Spectrogram of clean sp01



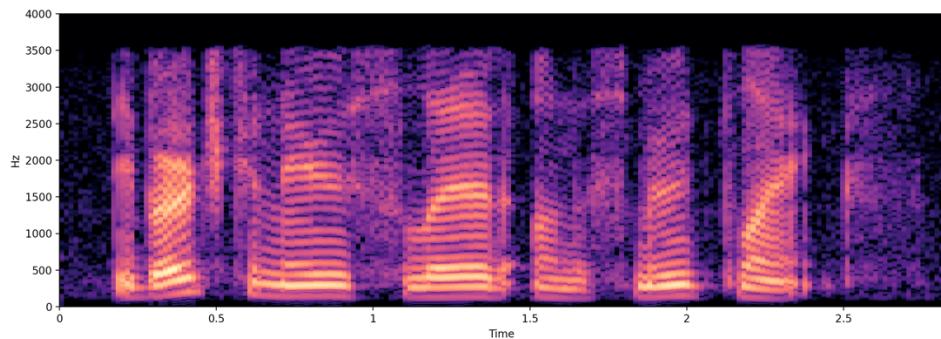
Spectrogram of sp01_station_sn5_spectralsubtraction.wav using Weiner filter



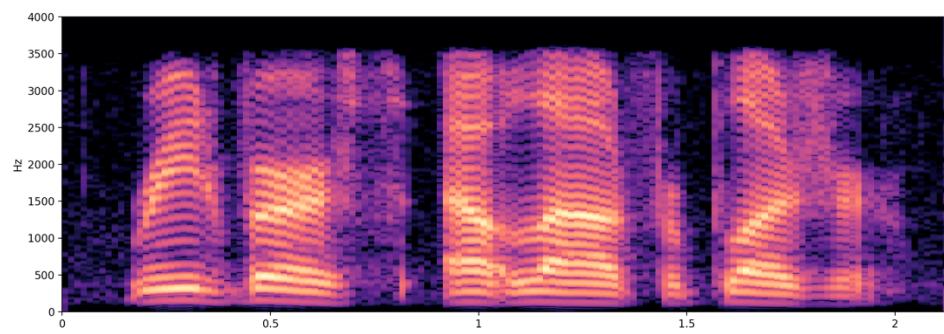
The Weiner filter produces similar outcome as that for the spectral subtraction. The spectrogram is similar, and the speech is almost the same.

Spectrogram for Clean signals

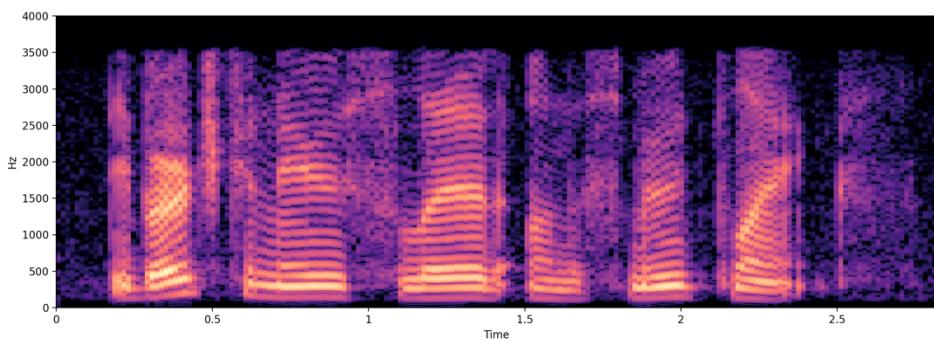
Sp01



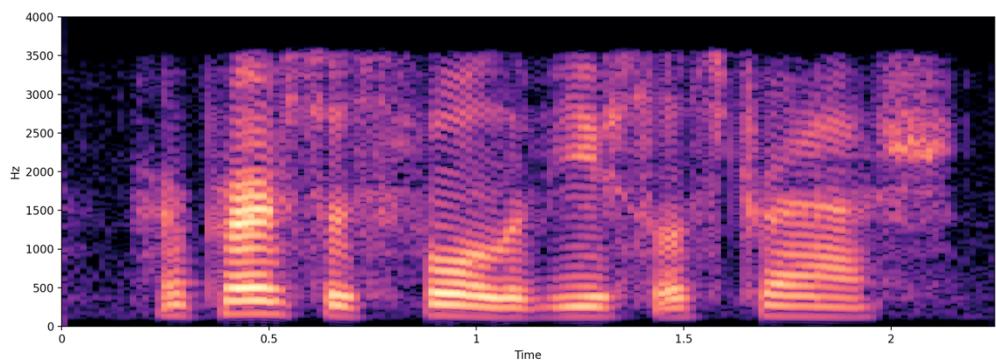
Sp02



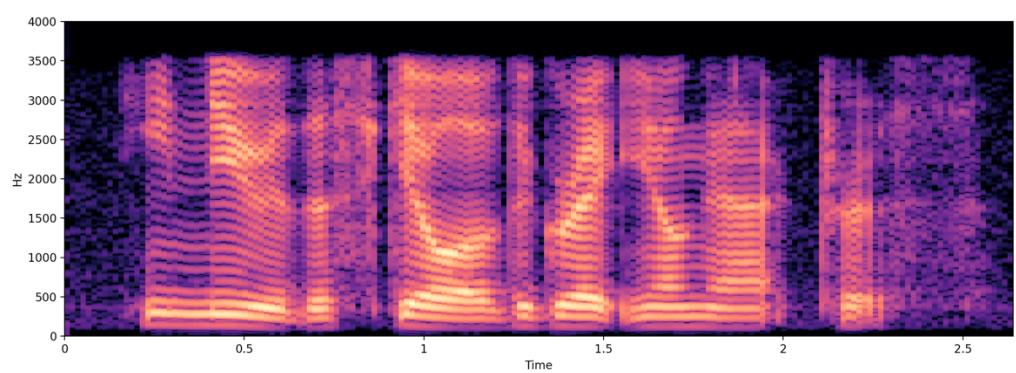
Sp03



Sp04

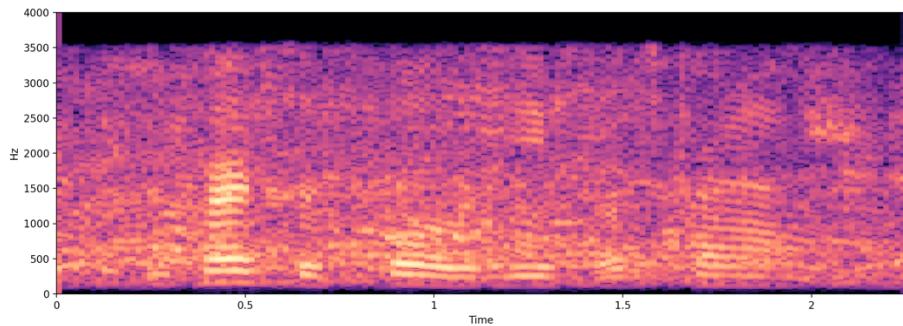


Sp05

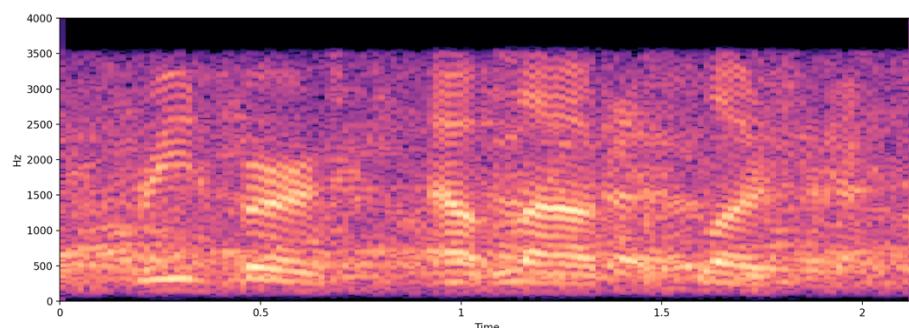


Spectrogram for Noisy signals (Babble)

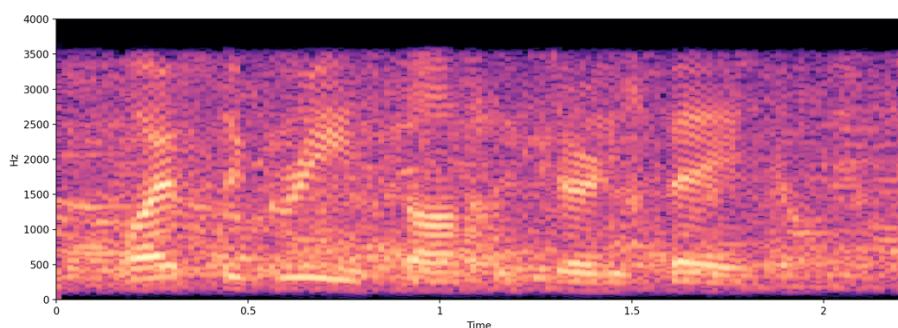
Sp01



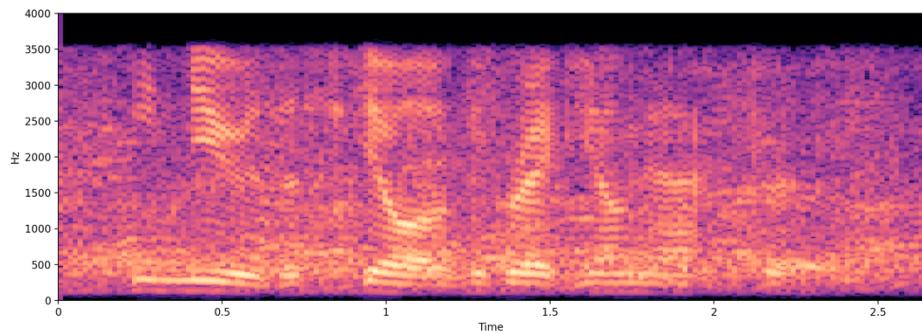
Sp02



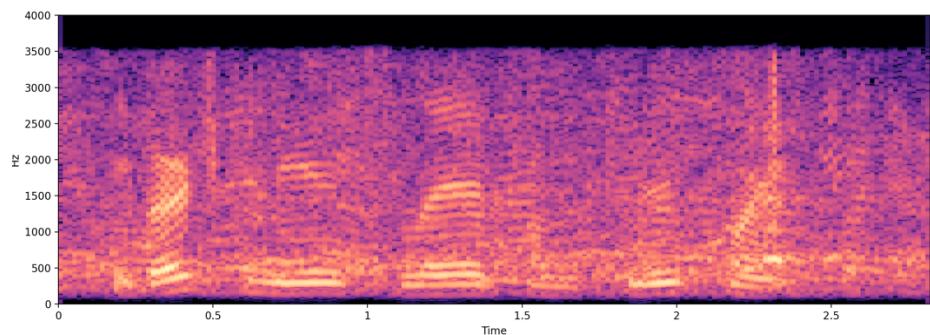
Sp03



Sp04

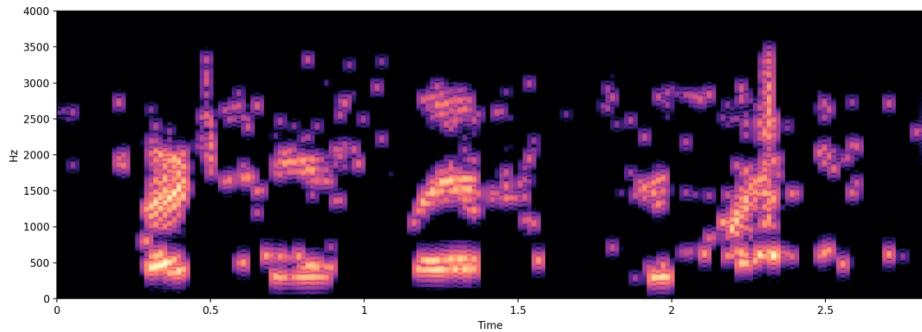


Sp05

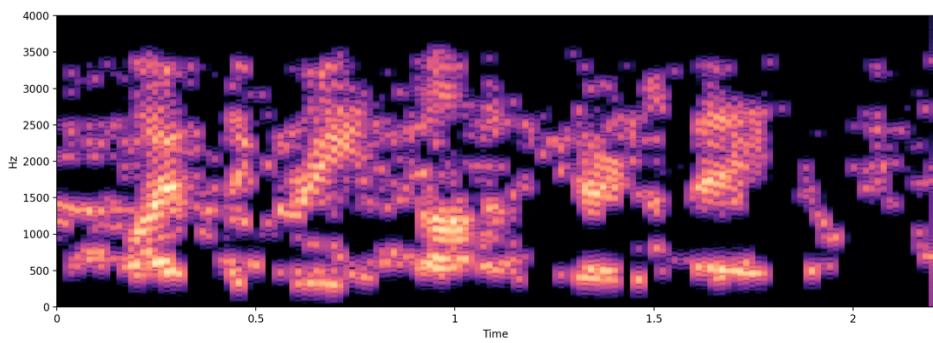


Spectral subtraction on the Babble sounds

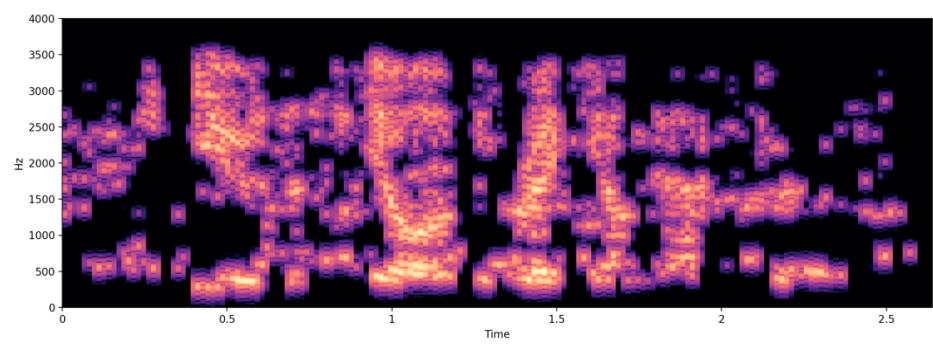
Sp01



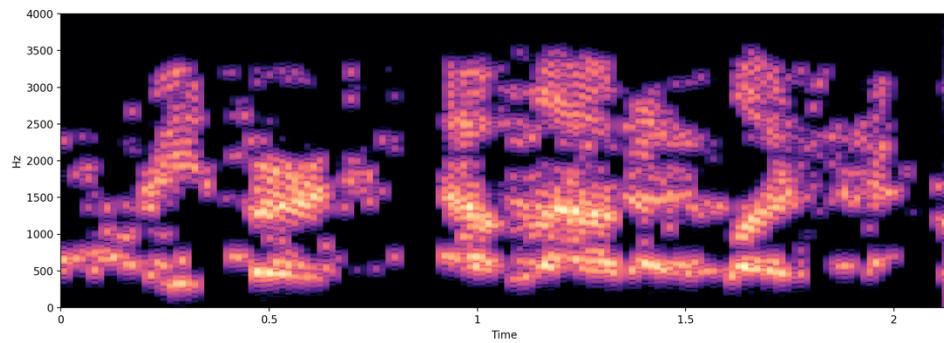
Sp02



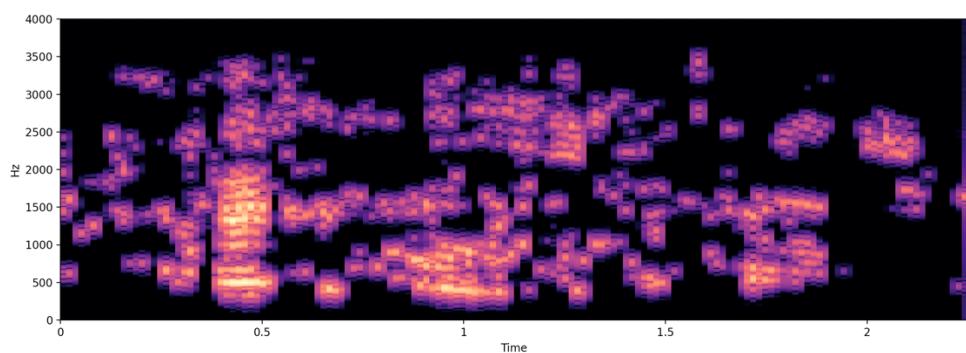
Sp03



Sp04



Sp05



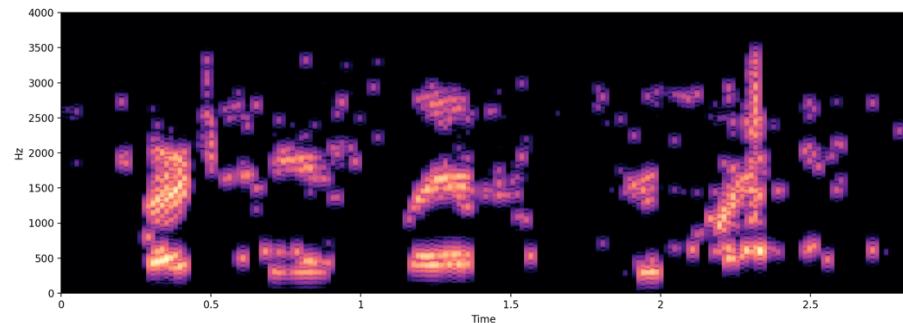
The audio for Sp01_spectral_subtraction was not clear and there was much distortion in the speech.

The audio for Sp02_spectral_subtraction was clearer and there was still lesser distortion in the speech as compared to Sp01_spectral_subtraction.

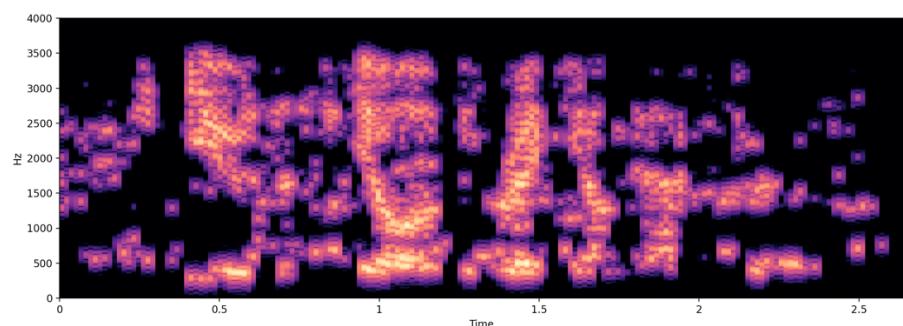
The audio for Sp03_spectral_subtraction, Sp04_spectral_subtraction and Sp05_spectral_subtraction were relatively clear and there were lesser distortion in the speech as compared to Sp01_spectral_subtraction and Sp02_spectral_subtraction.

Weiner filter on the Babble sounds

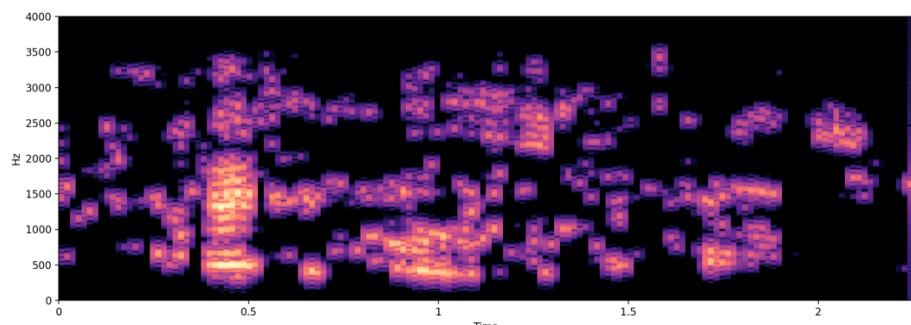
Sp01



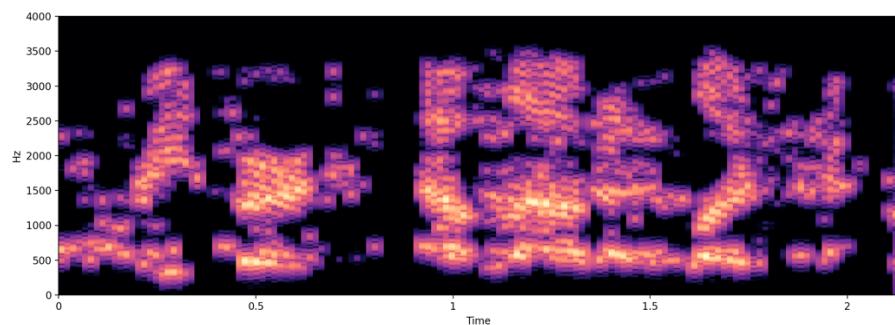
Sp02



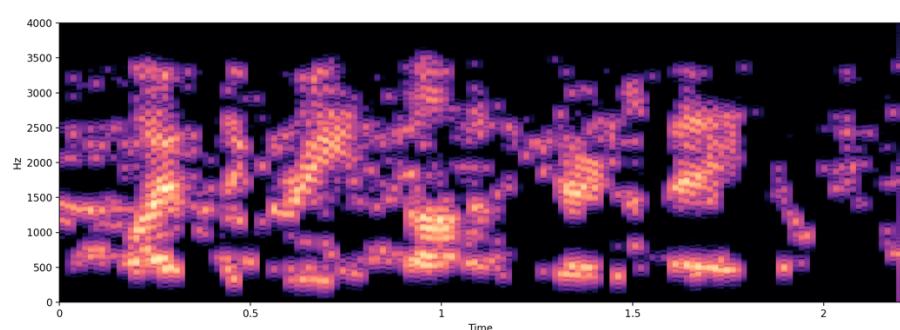
Sp03



Sp04



Sp05



The audio results are very similar to when using the spectral subtraction technique.