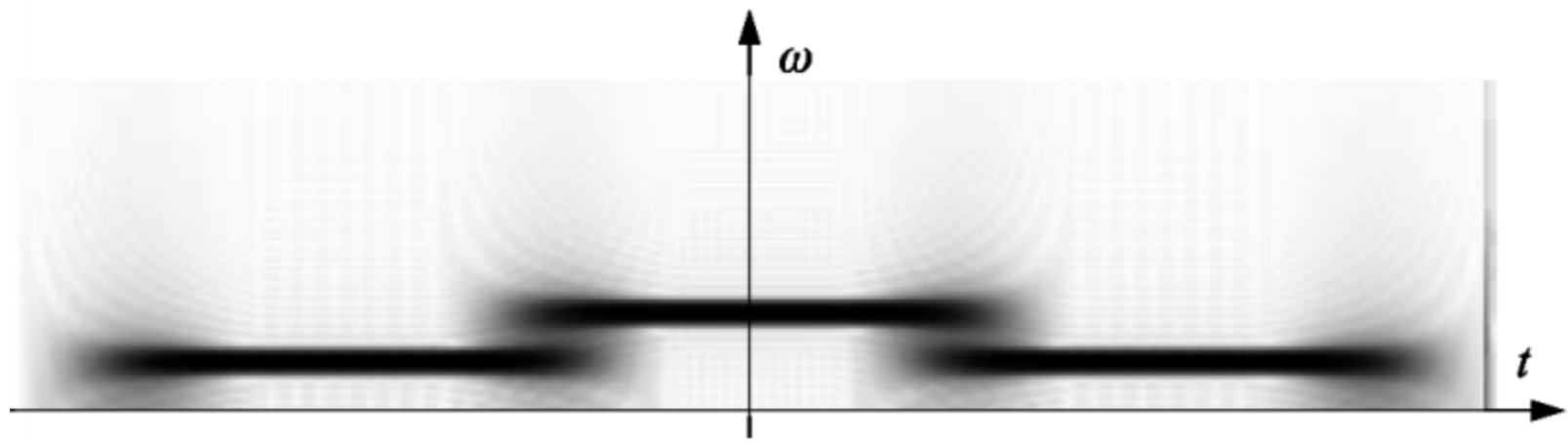
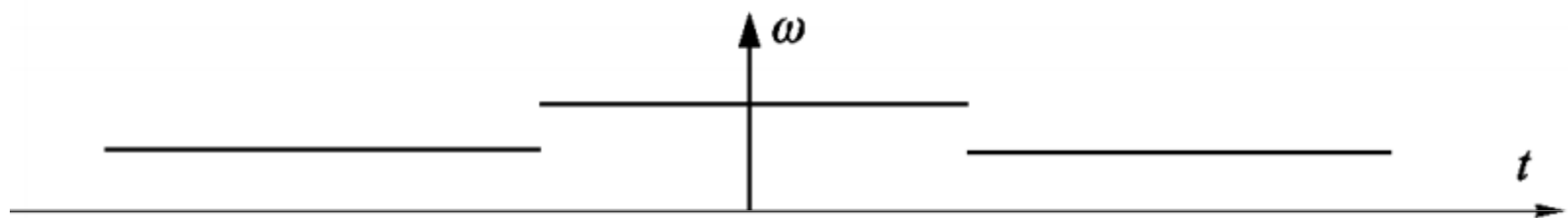
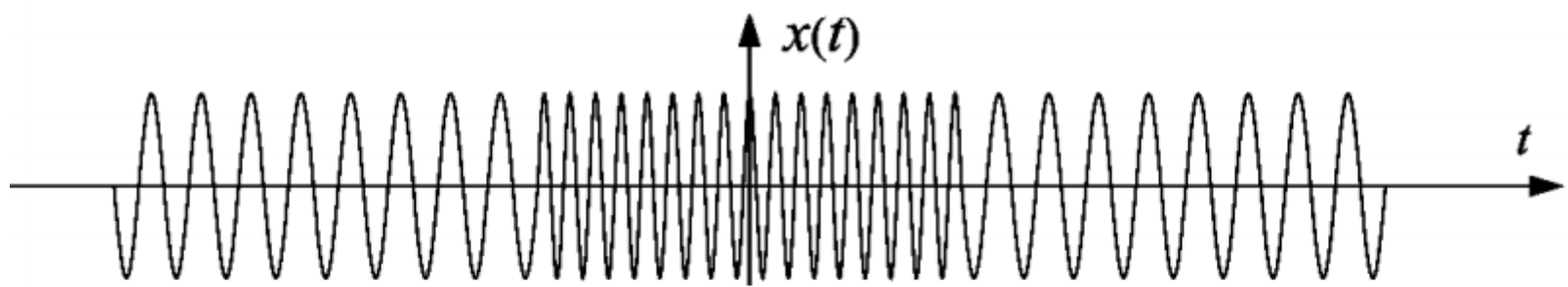
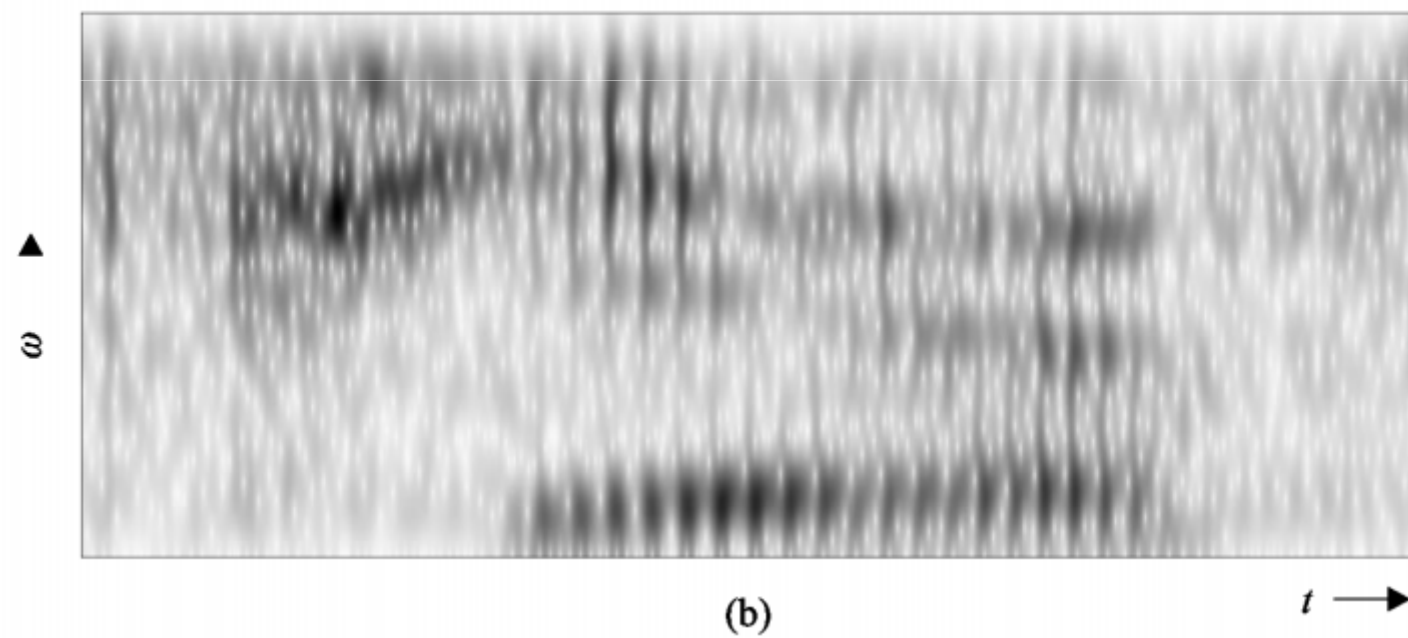
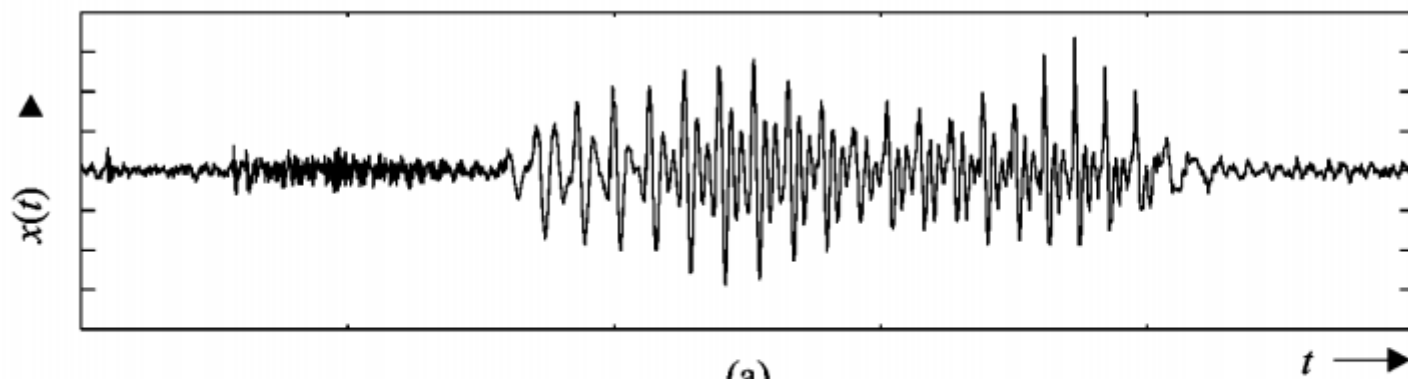


$$\begin{aligned}
 X[n, \omega_r] &= \sum_{m=-\infty}^{\infty} x[m] h[n-m] e^{-j\omega_r m} \\
 &\rightarrow = \text{DTFT}_m \{ x[m] h[n-m] \} \\
 &\rightarrow = \{ x[n] e^{-j\omega_r n} \} * h[n] \\
 &\rightarrow = e^{-j\omega_r n} \{ x[m] * h[m] \} \\
 &\rightarrow = e^{-j\omega_r n} \{ x[n] * h[m] e^{j\omega_r n} \}
 \end{aligned}$$

$$x[n] = \frac{1}{2\pi} \int_{-\pi}^{\pi} X[n, \omega] e^{j\omega n} d\omega$$





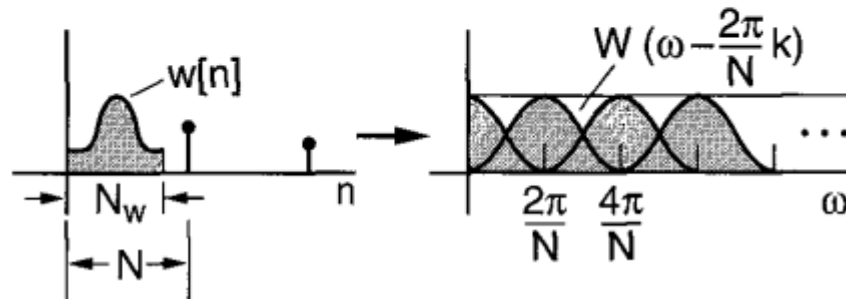
FBS Method

$$y[n] = \left[\frac{1}{Nw[0]} \right] \underbrace{\sum_{k=0}^{N-1} X(n, k) e^{j \frac{2\pi}{N} kn}}_{\text{Adding Frequency Components For Each } n}$$

Adding Frequency Components For Each n

FBS Constraint: $\sum_{k=0}^{N-1} W(\omega - \frac{2\pi}{N}k) = Nw[0]$

For $N_w < N \rightarrow y[n] = x[n]$



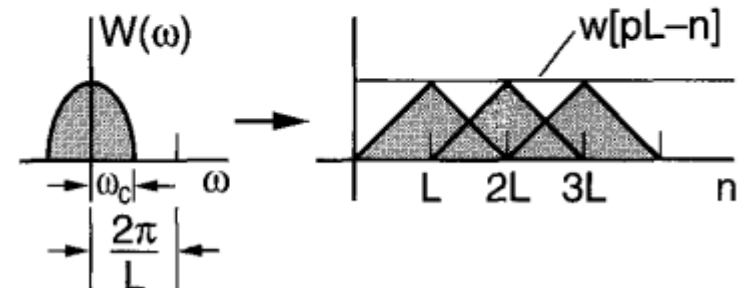
OLA Method

$$y[n] = \left[\frac{L}{W(0)} \right] \underbrace{\sum_{p=-\infty}^{\infty} x[n] w[pL-n]}_{\text{Adding Time Components For Each } n}$$

Adding Time Components For Each n

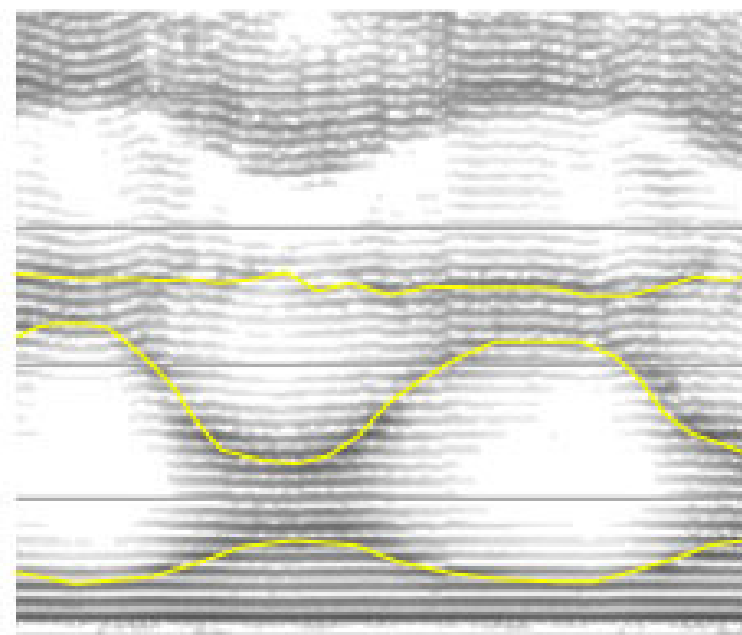
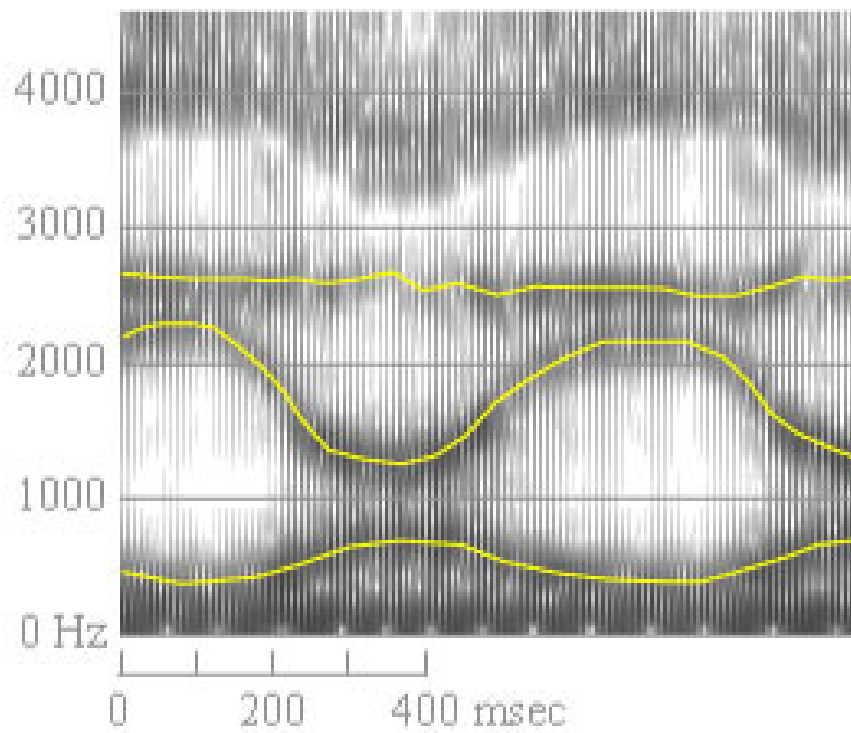
OLA Constraint: $\sum_{p=-\infty}^{\infty} w[pL-n] = \frac{W(0)}{L}$

For $\omega_c < \frac{2\pi}{L} \rightarrow y[n] = x[n]$



Wideband

Narrowband



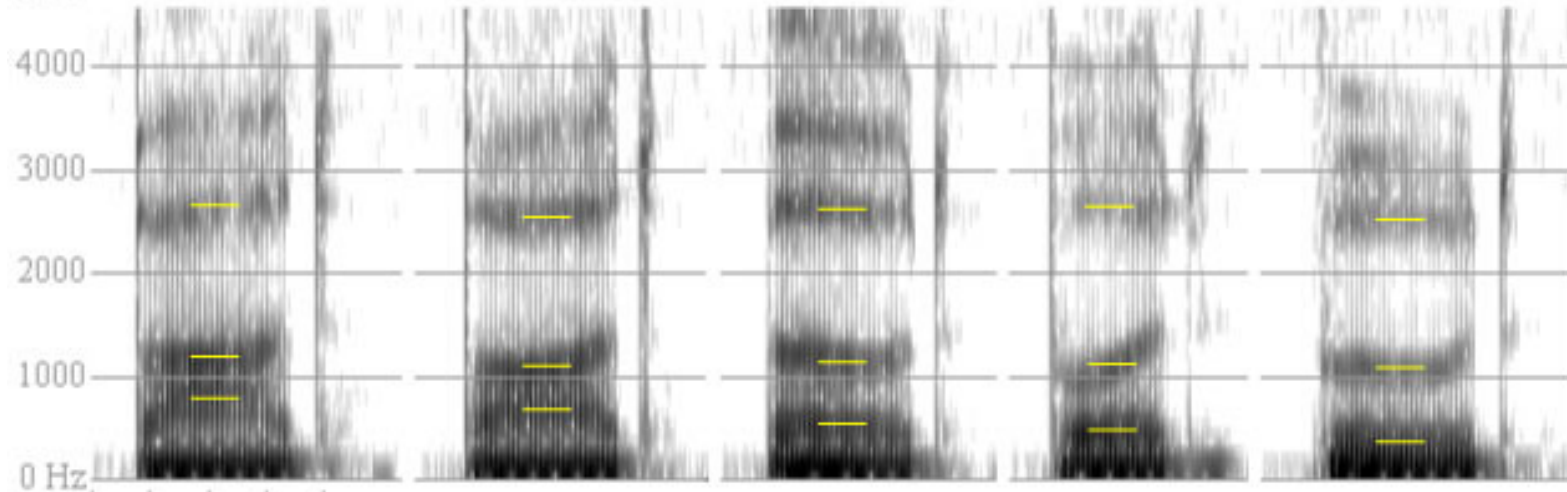
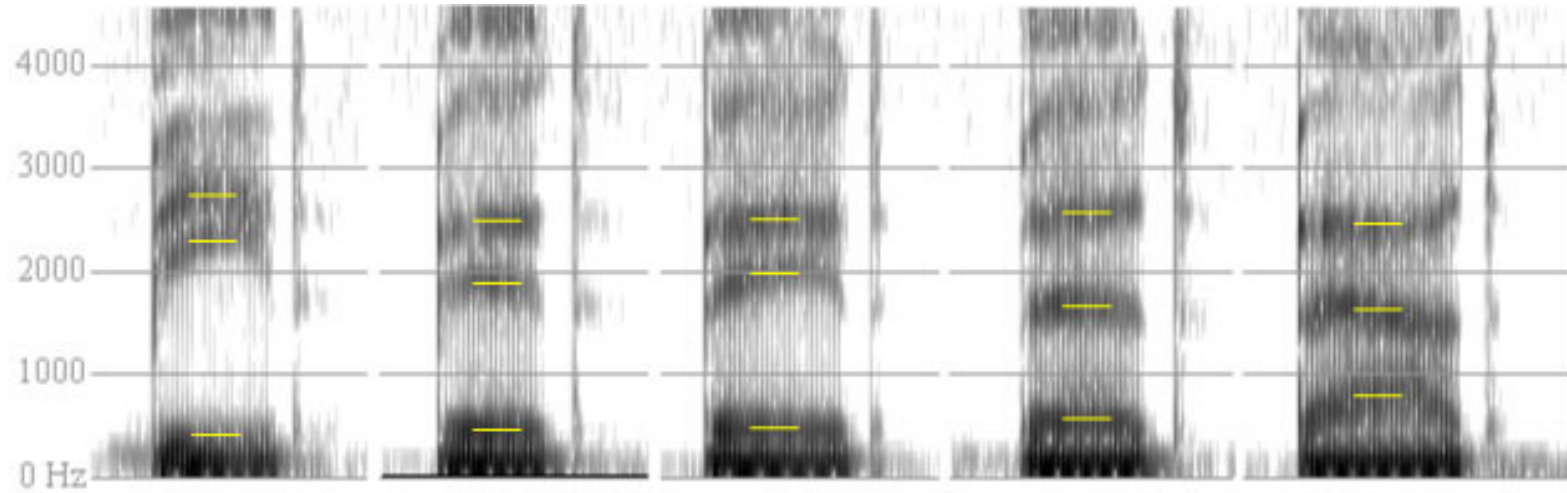
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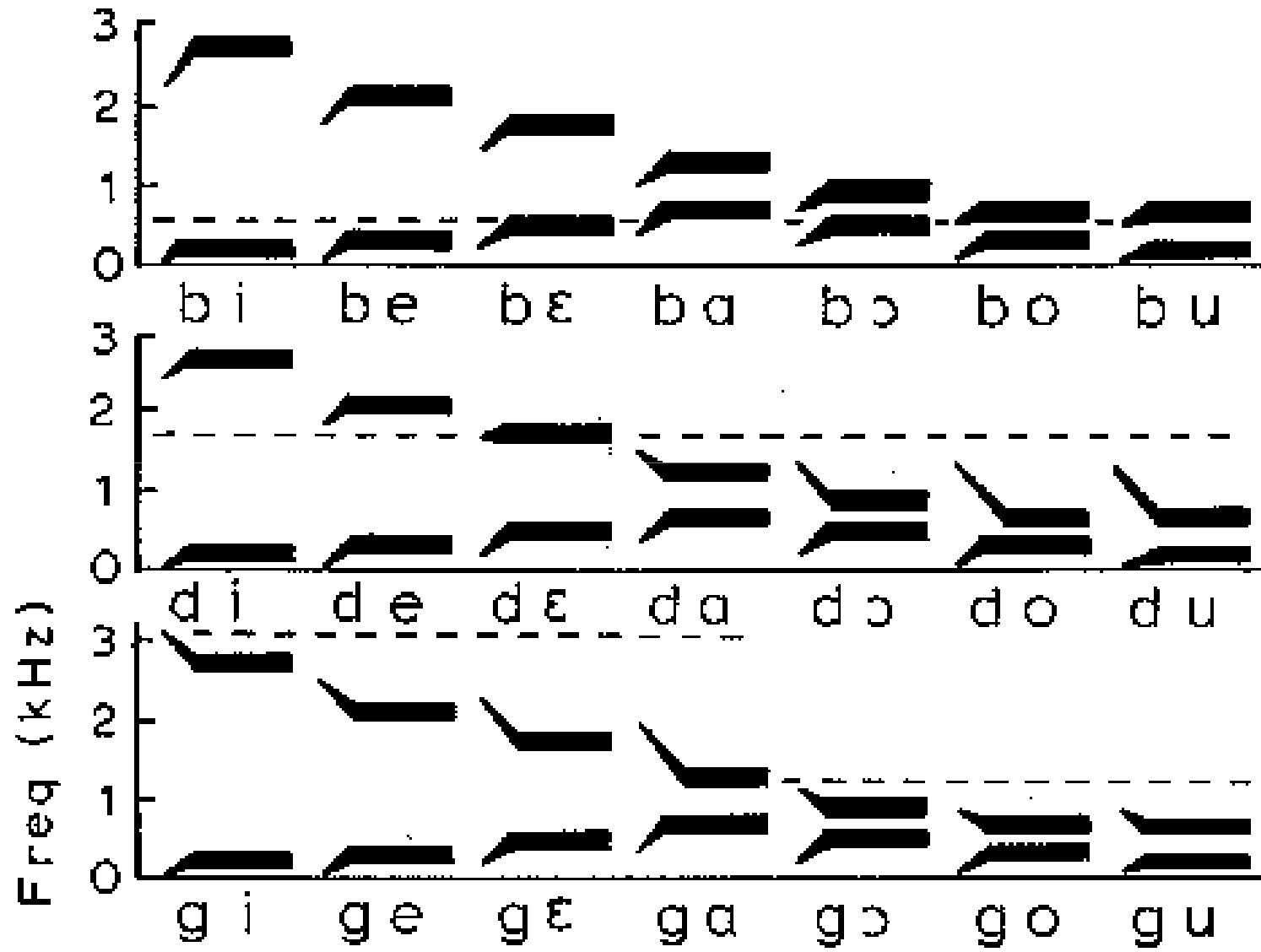
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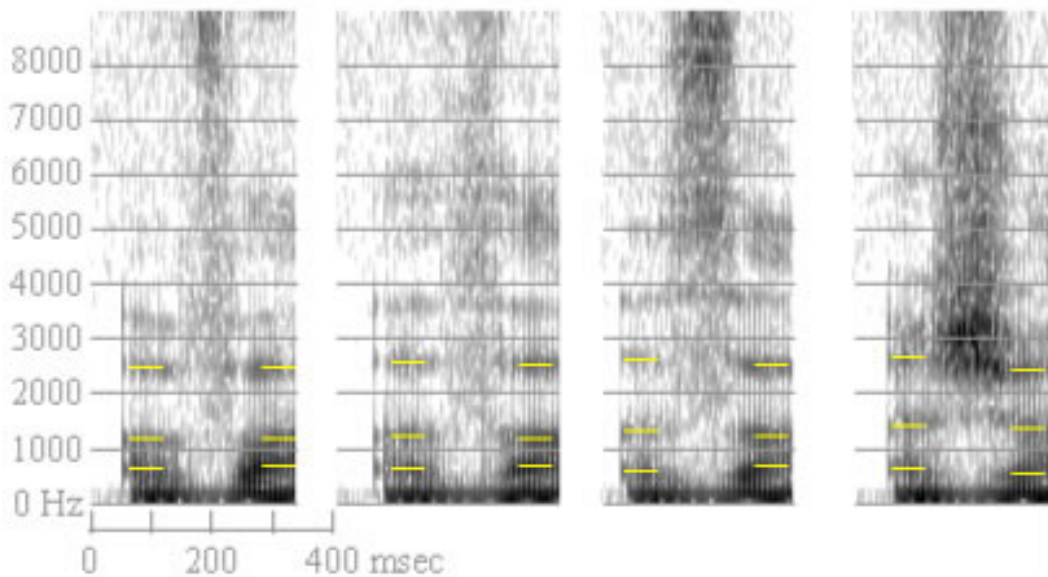
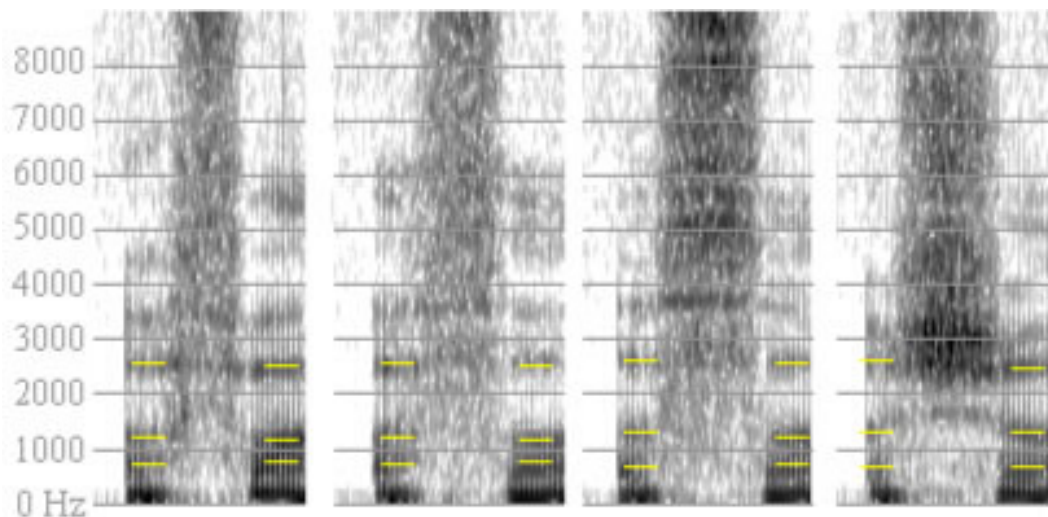
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