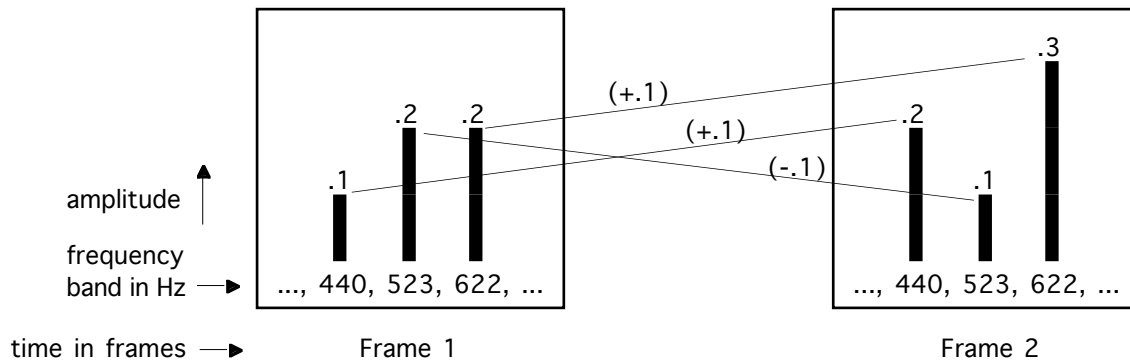


Spectral Mutations

Source, Target, and Mutation: Harmonic spectra of a **Source File** is combined with spectra of a **Target File** to produce a combination of the two files, called the **Mutation**.

Bands, Frames, and Intervals:



Intervals formed between bands at 440, 523, and 622 Hz for Frames 1 and 2.

Interval defined as $B_{n+1} - B_n$ for every band B in successive frames $n, n + 1$ such that

$$\begin{aligned} \text{Source Interval:} & \quad I(S) = B_{n+1}(S) - B_n(S) \\ \text{Target Interval:} & \quad I(T) = B_{n+1}(T) - B_n(T) \\ \text{Mutation Interval} & \quad I(M) = I(S) * I(T) \end{aligned}$$

where the function of $*$ varies according to the mutation type and mutation values selected.

Mutation Types:

USIM: Uniform Signed Interval Mutation. The operation $*$ acts on magnitudes and reverses signs (positive to negative and vice versa) of all bands of the Source and Target files.

ISIM: Irregular Signed Interval Mutation. The operation $*$ acts on magnitudes and reverses signs of randomly selected bands from the Source and Target files.

IUIM: Irregular Unsigned Interval Mutation. The operation $*$ acts on magnitudes, but not on the signs, of all bands of the Source and Target files.

UUIM: Uniform Unsigned Interval Mutation. The operation $*$ acts on magnitudes, but not on the signs, of randomly selected bands from the Source and Target files.

LCM: Linear Contour Mutation. The operation * combines the sign of the Source intervals with the magnitude of the Target intervals for randomly selected bands.

LCM/IUIM: Concatenation mutation in which IUIM is applied to the output of LCM.

LCM/UUIM: Concatenation mutation in which UUIM is applied to the output of LCM.