Figure 6: Minimum perceptible change in the pressure of 1000 Hz tones at 25 and 50 dB SL as measured by beat detection. From Riesz (1928).
Figure 7: Minimum perceptible change in the pressure of tones as a function of frequency and level as measured by beat detection for 4 Hz beats. From Riesz (1928).
Figure 8: Comparison of a true Amplitude Modulated waveform (upper plot in both panels) with the sum of two sinusoids (lower plot in both panels). The carrier of the AM waveform is a 30 Hz sinusoid, the modulating waveform is a 10 Hz sinusoid, and the depth of modulation is 0.3. The dotted envelopes indicate the modulating waveform. The time scale in the lower panel is expanded by a factor of 10. The dashed lines in the lower panel show that whereas the zero crossings of the AM waveform occur with the same periodicity as the carrier, those of the sum of two sinewaves do not.
Figure 9: Comparison of a true Amplitude Modulated waveform (upper plot in both panels) with the sum of two sinusoids (lower plot in both panels). The carrier of the AM waveform is a 30 Hz sinusoid, the modulating waveform is a 10 Hz sinusoid, and the depth of modulation is 0.3. The dotted envelopes indicate the modulating waveform. The time scale in the lower panel is expanded by a factor of 10. The dashed lines in the lower panel show that whereas the zero crossings of the AM waveform occur with the same periodicity as the carrier, those of the sum of two sinewaves do not.
When $B \ll A$ and $\delta \ll \omega$:

$$p_2(t) = A \cos \omega t + B \cos (\omega + \delta) t$$

$$\approx A \left[ 1 + \frac{B}{A} \cos \delta t \right] \times \cos \left( \omega \left[ 1 + \frac{B \delta}{A \omega} \cos \delta t \right] t + \phi \right)$$

Max to min amplitude ratio:

$$\frac{A + B}{A - B} = \frac{1 + B/A}{1 - B/A} \approx 1 + \frac{2B}{A}$$

Max to min instantaneous frequency ratio:

$$\frac{\omega + B\delta/A}{\omega - B\delta/A} \approx 1 + \frac{2B \delta}{A \omega}.$$
Figure 10: JNDS for intensity discrimination of white noise (flat spectrum within \( \pm 5 \text{ dB} \) between 150 and 7000 Hz), from Miller (1947).
Figure 11: Measurements of the Weber fraction for intensity ($W(I) = \Delta I/I$) plotted on a logarithmic scale. From Viemeister (1988).
Figure 12: Dependence of $\Delta I/I$ on $I$ for 200–8000 Hz tones as a function of sensation Level. From Jesteadt et al., (1977).