Masking phenomenon:

It is observed that a *low level* audio signal is rendered inaudible, if there is a simultaneous occurrence of a *stronger* audio signal, which is close in frequency to the former.

- The masking is largest in the critical band in which the masker is located

Masker: the stronger signal

Masked frequency/Maskee: the weaker signal

Masking threshold: below which the presence of any audio will be rendered inaudible

The masking threshold will depend upon the sound pressure level (SPL), the frequency of the masker and the characteristics of the masker and the maskee, such as whether the masker or maskee is a tone or noise.

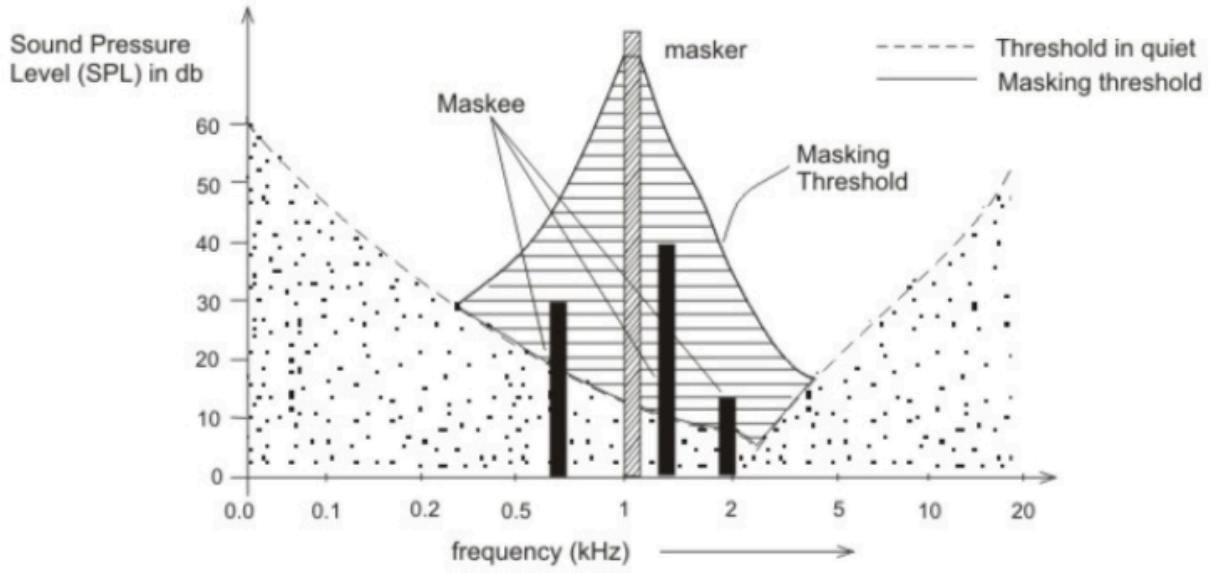


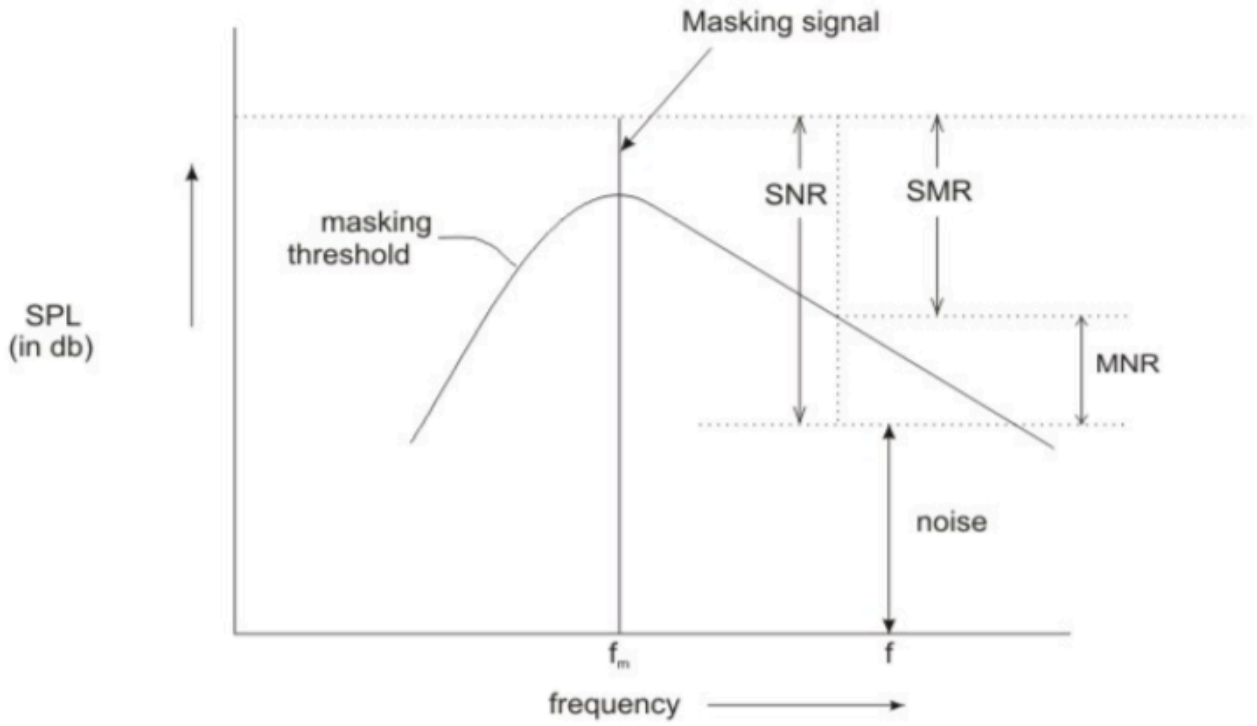
FIGURE 28.1 Effects of masking in presence of a masker at 1 kHz

From the diagram: the slope of the masking threshold is steeper towards the lower frequencies, that is lower frequencies are not masked to the extent in which the higher frequencies are masked.

Masking characteristics

Signal to mask ratio (SMR): The **SMR** at a given frequency is expressed as the difference (in dB) between the SPL of the masker and the masking threshold at that frequency.

Mask to noise ratio (MNR): The **MNR** at a given frequency is expressed as the difference (in dB) between the masking threshold at that frequency and the noise level. To make the noise inaudible, its level should be below the masking threshold i.,e the MNR should be positive.



a masking signal occurs at frequency f_m, giving rise to the masking threshold curve, as shown. At a given frequency *f*, the *SMR*, the signal to noise ratio (*SNR*) and the *MNR* corresponding to the noise level is shown.

SMR (f) = SNR (f) – NMR (f)