

Handout #17

3.2.6 Half-Power Bandwidth

An important property of the frequency response curve for R_d is shown in Fig. 3.2.9, where the *half-power bandwidth* is defined. If ω_a and ω_b are the forcing frequencies on either side

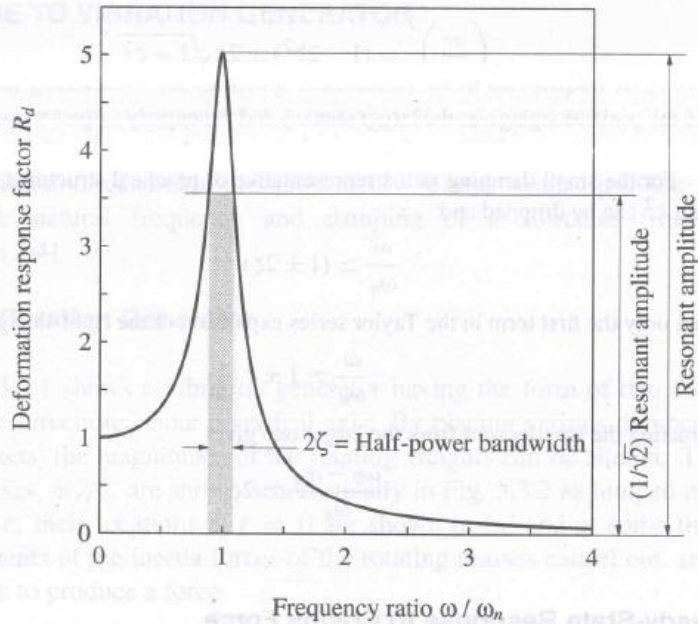


Figure 3.2.9 Definition of half-power bandwidth.

of the resonant frequency at which the amplitude u_o is $1/\sqrt{2}$ times the resonant amplitude, then for small ζ

$$\frac{\omega_b - \omega_a}{\omega_n} = 2\zeta \quad (3.2.23)$$

This result, derived in Derivation 3.4, can be rewritten as

$$\zeta = \frac{\omega_b - \omega_a}{2\omega_n} \quad \text{or} \quad \zeta = \frac{f_b - f_a}{2f_n} \quad (3.2.24)$$