

Modal shape elements:

$$\phi_{rj} = \sqrt{-2\xi_j \omega_j^2 \operatorname{Im}[H_{rr}(\omega_j)]}$$

$$\phi_{sj} = \frac{-2\xi_j \omega_j^2 \operatorname{Im}[H_{rs}(\omega_j)]}{\phi_{rj}}; \quad s = 1, \dots, n \quad y \quad s \neq r$$

Where:

r = measurement point

s = excitation point

Φ = value of the modal shape

ζ = damping

ω = natural frequency mode j

$\operatorname{Im}[H_{xx}(\omega_j)]$ = Imaginary part of FRF between points X and X at resonance