Detected Resonant Frequencies (0-200 Hz):
16
44
52
66
88
176

Estimated Damping Ratios:
Mode near 16.00 Hz → ζ = 0.1250
Mode near 44.00 Hz → ζ = 0.0455
Mode near 52.00 Hz → ζ = 0.0577
Mode near 66.00 Hz → ζ = 0.0303
Mode near 88.00 Hz → ζ = 0.0341
Mode near 176.00 Hz → ζ = 0.0284

Normalized Mode Shapes (0-200 Hz):

Mode at 16.00 Hz:
X: 1.000∠174.5°
Y: 0.143∠178.5°
Z: 0.119∠172.2°

Mode at 44.00 Hz:
X: 1.000∠-5.9°
Y: 0.477∠-86.4°
Z: 0.614∠-2.8°

Mode at 52.00 Hz:
X: 1.000∠-115.6°
Y: 0.047∠92.3°
Z: 0.531∠-114.0°

Mode at 66.00 Hz:
X: 0.940∠46.5°
Y: 0.699∠88.6°
Z: 1.000∠9.2°

Mode at 88.00 Hz:

X: 0.338∠-172.2°
Y: 1.000∠-36.0°
Z: 0.222∠-164.2°

Mode at 176.00 Hz:
X: 0.239∠-105.3°
Y: 1.000∠137.6°
Z: 0.673∠-177.0°
=== Modal Parameter Summary (0-200 Hz) ===
Freq_Hz Damping Phi_X Phi_Y Phi_Z
——— ——— ——————— ——————— ———————

16 0.125 -0.99531+0.096688i -0.14306+0.0036939i -0.11799+0.016156i
44 0.045455 0.99473-0.10258i 0.030324-0.4756i 0.61373-0.029724i
52 0.057692 -0.4318-0.90197i -0.0018707+0.046595i -0.21599-0.48506i
66 0.030303 0.64737+0.68185i 0.017576+0.69845i 0.98718+0.15961i
88 0.034091 -0.33442-0.045594i 0.80944-0.5872i -0.21311-0.060386i
176 0.028409 -0.062927-0.23071i -0.73857+0.67418i -0.67205-0.03497i

Detected Resonant Frequencies (0-200 Hz):
16
44
52
66
88
176

Estimated Damping Ratios:
0.1250
0.0455
0.0577
0.0303
0.0341
0.0284

=== Modal Summary (0-200 Hz) ===
Mode 1: f=16.00 Hz, Damping=0.1250, k_dyn_X=1296909.92 N/m, k_dyn_Y=9062775.51 N/m, k_dyn_Z=10890327.34 N/m

Mode Shape (X,Y,Z): 1.000∠174.5°, 0.143∠178.5°, 0.119∠172.2°
Mode 2: f=44.00 Hz, Damping=0.0455, k_dyn_X=23718977.78 N/m, k_dyn_Y=49770659.73 N/m, k_dyn_Z=38601894.21 N/m
Mode Shape (X,Y,Z): 1.000∠-5.9°, 0.477∠-86.4°, 0.614∠-2.8°
Mode 3: f=52.00 Hz, Damping=0.0577, k_dyn_X=5878833.16 N/m, k_dyn_Y=126066890.15 N/m, k_dyn_Z=11071764.53 N/m
Mode Shape (X,Y,Z): 1.000∠-115.6°, 0.047∠92.3°, 0.531∠-114.0°
Mode 4: f=66.00 Hz, Damping=0.0303, k_dyn_X=184226668.24 N/m, k_dyn_Y=247919491.74 N/m, k_dyn_Z=173213269.32 N/m
Mode Shape (X,Y,Z): 0.940∠46.5°, 0.699∠88.6°, 1.000∠9.2°
Mode 5: f=88.00 Hz, Damping=0.0341, k_dyn_X=173050266.19 N/m, k_dyn_Y=58407516.90 N/m, k_dyn_Z=263688589.21 N/m
Mode Shape (X,Y,Z): 0.338∠-172.2°, 1.000∠-36.0°, 0.222∠-164.2°
Mode 6: f=176.00 Hz, Damping=0.0284, k_dyn_X=726327027.02 N/m, k_dyn_Y=173695395.65 N/m, k_dyn_Z=258107122.28 N/m
Mode Shape (X,Y,Z): 0.239∠-105.3°, 1.000∠137.6°, 0.673∠-177.0°