Detected Resonant Frequencies (0-200 Hz):
18
80
120
124

Estimated Damping Ratios:
Mode near 18.00 Hz → ζ = 0.1667
Mode near 80.00 Hz → ζ = 0.0250
Mode near 120.00 Hz → ζ = 0.0417
Mode near 124.00 Hz → ζ = 0.0484

Normalized Mode Shapes (0-200 Hz):

Mode at 18.00 Hz:
X: 0.072∠8.0°
Y: 0.348∠10.0°
Z: 1.000∠10.0°

Mode at 80.00 Hz:
X: 0.888∠-164.8°
Y: 0.207∠44.4°
Z: 1.000∠65.7°

Mode at 120.00 Hz:
X: 0.188∠72.7°
Y: 1.000∠82.0°
Z: 0.541∠87.4°

Mode at 124.00 Hz:
X: 0.200∠38.4°
Y: 1.000∠45.4°
Z: 0.736∠50.2°
=== Modal Parameter Summary (0-200 Hz) ===

Freq_Hz	**Damping**	**Phi_X**	**Phi_Y**	**Phi_Z**
18	0.16667	0.070978+0.0099807i	0.34267+0.060707i	0.98478+0.17379i
80	0.025	-0.85674-0.23231i	0.14808+0.14486i	0.41179+0.91128i

120 0.041667 0.055785+0.17942i 0.13945+0.99023i 0.02421+0.54052i
124 0.048387 0.15671+0.12419i 0.70205+0.71213i 0.47157+0.56503i

Detected Resonant Frequencies (0-200 Hz):
18
80
120
124

Estimated Damping Ratios:
0.1667
0.0250
0.0417
0.0484

=== Modal Summary (0-200 Hz) ===
Mode 1: f=18.00 Hz, Damping=0.1667, k_dyn_X=4827571.04 N/m, k_dyn_Y=994310.16 N/m, k_dyn_Z=346023.05 N/m
Mode Shape (X,Y,Z): 0.072∠8.0°, 0.348∠10.0°, 1.000∠10.0°
Mode 2: f=80.00 Hz, Damping=0.0250, k_dyn_X=11706326.53 N/m, k_dyn_Y=50162805.39 N/m, k_dyn_Z=10391395.24 N/m
Mode Shape (X,Y,Z): 0.888∠-164.8°, 0.207∠44.4°, 1.000∠65.7°
Mode 3: f=120.00 Hz, Damping=0.0417, k_dyn_X=63620015.41 N/m, k_dyn_Y=11953566.91 N/m, k_dyn_Z=22092825.86 N/m
Mode Shape (X,Y,Z): 0.188∠72.7°, 1.000∠82.0°, 0.541∠87.4°
Mode 4: f=124.00 Hz, Damping=0.0484, k_dyn_X=74949207.21 N/m, k_dyn_Y=14986259.60 N/m, k_dyn_Z=20362788.43 N/m
Mode Shape (X,Y,Z): 0.200∠38.4°, 1.000∠45.4°, 0.736∠50.2°