Detected Resonant Frequencies (0-200 Hz):
16
80
120
124
150

Estimated Damping Ratios:
Mode near 16.00 Hz → ζ = 0.1250
Mode near 80.00 Hz → ζ = 0.0250
Mode near 120.00 Hz → ζ = 0.0500
Mode near 124.00 Hz → ζ = 0.0484
Mode near 150.00 Hz → ζ = 0.0533

Normalized Mode Shapes (0-200 Hz):

Mode at 16.00 Hz:
X: 0.129∠-15.3°
Y: 0.455∠-5.3°
Z: 1.000∠167.0°

Mode at 80.00 Hz:
X: 1.000∠-157.0°
Y: 0.175∠-128.6°
Z: 0.970∠70.0°

Mode at 120.00 Hz:
X: 0.080∠-93.1°
Y: 1.000∠-91.3°
Z: 0.769∠83.5°

Mode at 124.00 Hz:
X: 0.087∠-124.9°
Y: 1.000∠-128.1°
Z: 0.891∠47.3°

Mode at 150.00 Hz:
X: 0.149∠-159.6°
Y: 0.950∠-153.1°

Z: 1.000∠12.6°
=== Modal Parameter Summary (0-200 Hz) ===

Freq_Hz	Damping	Phi_X	Phi_Y	Phi_Z
16	0.125	0.12486-0.034234i	0.45278-0.041985i	-0.97423+0.22555i
80	0.025	-0.92064-0.39041i	-0.10915-0.13678i	0.3323+0.91083i
120	0.05	-0.0043097-0.080017i	-0.021839-0.99976i	0.086793+0.76456i
124	0.048387	-0.049634-0.071255i	-0.617-0.78697i	0.60361+0.65509i
150	0.053333	-0.14002-0.052182i	-0.84716-0.4307i	0.97578+0.21876i

Detected Resonant Frequencies (0-200 Hz):
16
80
120
124
150

Estimated Damping Ratios:
0.1250
0.0250
0.0500
0.0484
0.0533

=== Modal Summary (0-200 Hz) ===
Mode 1: f=16.00 Hz, Damping=0.1250, k_dyn_X=2128092.94 N/m, k_dyn_Y=605904.94 N/m, k_dyn_Z=275518.29 N/m
Mode Shape (X,Y,Z): 0.129∠-15.3°, 0.455∠-5.3°, 1.000∠167.0°
Mode 2: f=80.00 Hz, Damping=0.0250, k_dyn_X=12971967.05 N/m, k_dyn_Y=74129870.31 N/m, k_dyn_Z=13379248.90 N/m
Mode Shape (X,Y,Z): 1.000∠-157.0°, 0.175∠-128.6°, 0.970∠70.0°
Mode 3: f=120.00 Hz, Damping=0.0500, k_dyn_X=181630918.87 N/m, k_dyn_Y=14554593.29 N/m, k_dyn_Z=18915155.87 N/m
Mode Shape (X,Y,Z): 0.080∠-93.1°, 1.000∠-91.3°, 0.769∠83.5°
Mode 4: f=124.00 Hz, Damping=0.0484, k_dyn_X=195563610.00 N/m, k_dyn_Y=16982302.96 N/m, k_dyn_Z=19064430.40 N/m

Mode Shape (X,Y,Z): 0.087∠-124.9°, 1.000∠-128.1°, 0.891∠47.3°
Mode 5: f=150.00 Hz, Damping=0.0533, k_dyn_X=473612729.85 N/m, k_dyn_Y=74465394.95 N/m, k_dyn_Z=70768929.27 N/m
Mode Shape (X,Y,Z): 0.149∠-159.6°, 0.950∠-153.1°, 1.000∠12.6°