Detected Resonant Frequencies (0-200 Hz):
16
78
120

Estimated Damping Ratios:
Mode near 16.00 Hz → ζ = 0.1250
Mode near 78.00 Hz → ζ = 0.0385
Mode near 120.00 Hz → ζ = 0.0583

Normalized Mode Shapes (0-200 Hz):

Mode at 16.00 Hz:
X: 0.406∠171.9°
Y: 0.281∠5.4°
Z: 1.000∠169.6°

Mode at 78.00 Hz:
X: 1.000∠133.5°
Y: 0.217∠125.2°
Z: 0.514∠73.6°

Mode at 120.00 Hz:
X: 0.333∠-132.1°
Y: 0.482∠-122.9°
Z: 1.000∠-120.0°
=== Modal Parameter Summary (0-200 Hz) ===

Freq_Hz	Damping	Phi_X	Phi_Y	Phi_Z
16	0.125	-0.40189+0.057488i	0.27973+0.026402i	-0.98345+0.18116i
78	0.038462	-0.6882+0.72552i	-0.12487+0.17696i	0.14515+0.49299i
120	0.058333	-0.22354-0.24726i	-0.26159-0.40456i	-0.49976-0.86616i

Detected Resonant Frequencies (0-200 Hz):
16
78

120

Estimated Damping Ratios:
0.1250
0.0385
0.0583

=== Modal Summary (0-200 Hz) ===
Mode 1: f=16.00 Hz, Damping=0.1250, k_dyn_X=496954.41 N/m, k_dyn_Y=718064.15 N/m, k_dyn_Z=201753.77 N/m
Mode Shape (X,Y,Z): 0.406∠171.9°, 0.281∠5.4°, 1.000∠169.6°
Mode 2: f=78.00 Hz, Damping=0.0385, k_dyn_X=4103182.04 N/m, k_dyn_Y=18944851.44 N/m, k_dyn_Z=7984174.26 N/m
Mode Shape (X,Y,Z): 1.000∠133.5°, 0.217∠125.2°, 0.514∠73.6°
Mode 3: f=120.00 Hz, Damping=0.0583, k_dyn_X=12093339.37 N/m, k_dyn_Y=8367285.92 N/m, k_dyn_Z=4031058.18 N/m
Mode Shape (X,Y,Z): 0.333∠-132.1°, 0.482∠-122.9°, 1.000∠-120.0°