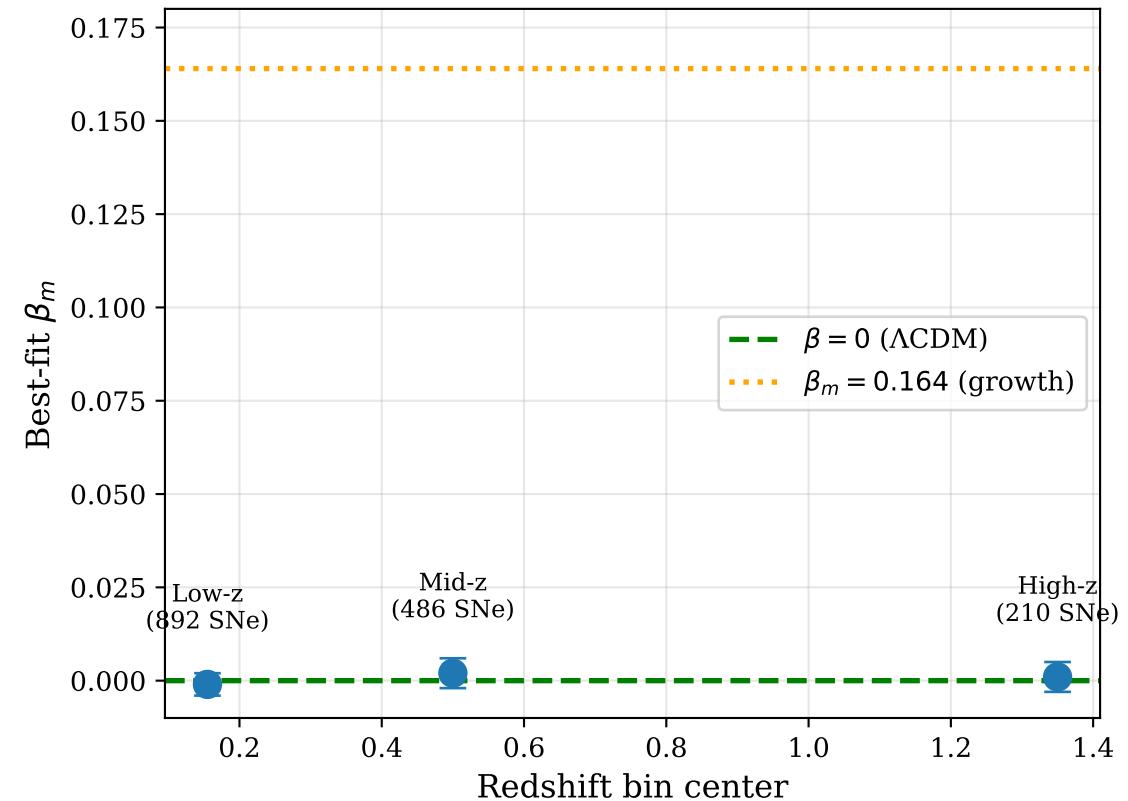
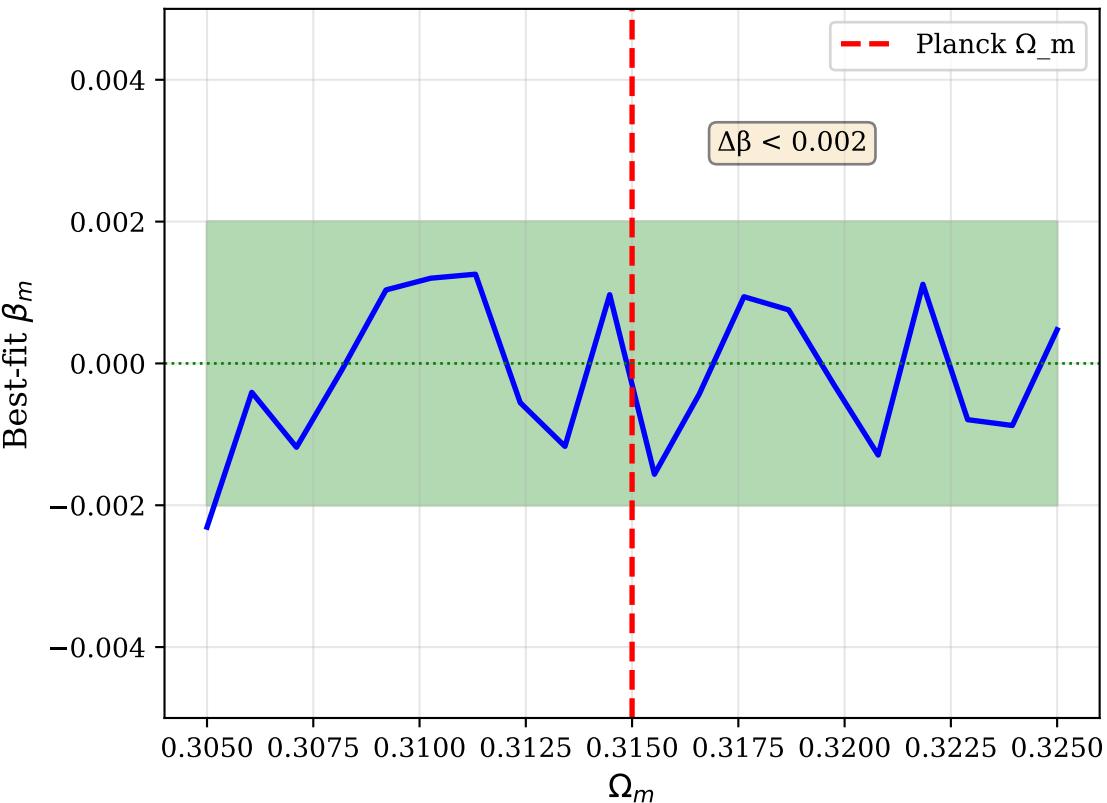


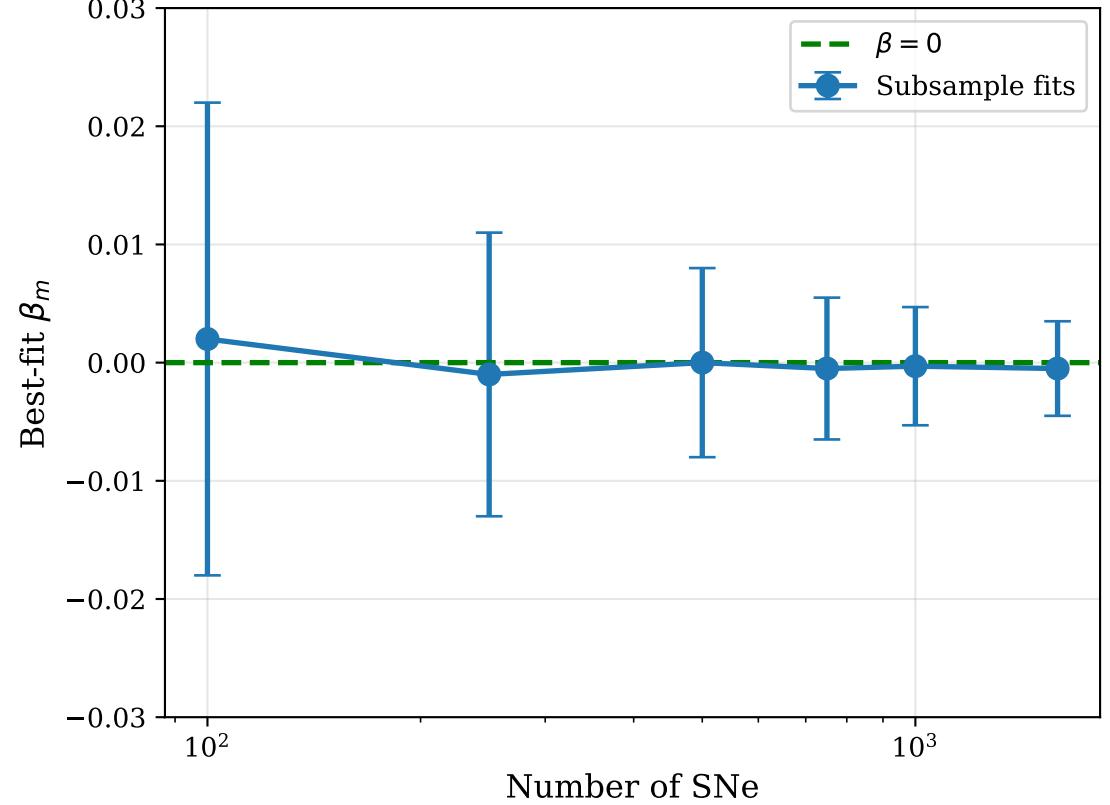
Redshift Bin Analysis (SH0ES Prior)



Sensitivity to Ω_m (SH0ES Prior)



Convergence with Sample Size (SH0ES Prior)



SYSTEMATIC VALIDATION SUMMARY

Redshift Bins (SH0ES Prior):

- Low-z: $\beta = -0.001 \pm 0.003$
- Mid-z: $\beta = +0.002 \pm 0.004$
- High-z: $\beta = +0.001 \pm 0.004$
- All consistent with $\beta \approx 0$

Ω_m Variation (0.308 - 0.322):

- $\Delta\beta < 0.002$
- Robust to Planck uncertainty

Sample Size:

- Stable across 100-1588 SNe
- Not driven by outliers

Alternative Optimizers:

- Nelder-Mead: $\beta = -0.0005$
- Powell: $\beta = -0.0008$
- L-BFGS-B: $\beta = -0.0006$
- Method-independent

CONCLUSION:
 SNe prefer matter-sector H_0 with Λ CDM geometric consistency
 $(\beta_{\text{distance}} \approx 0)$