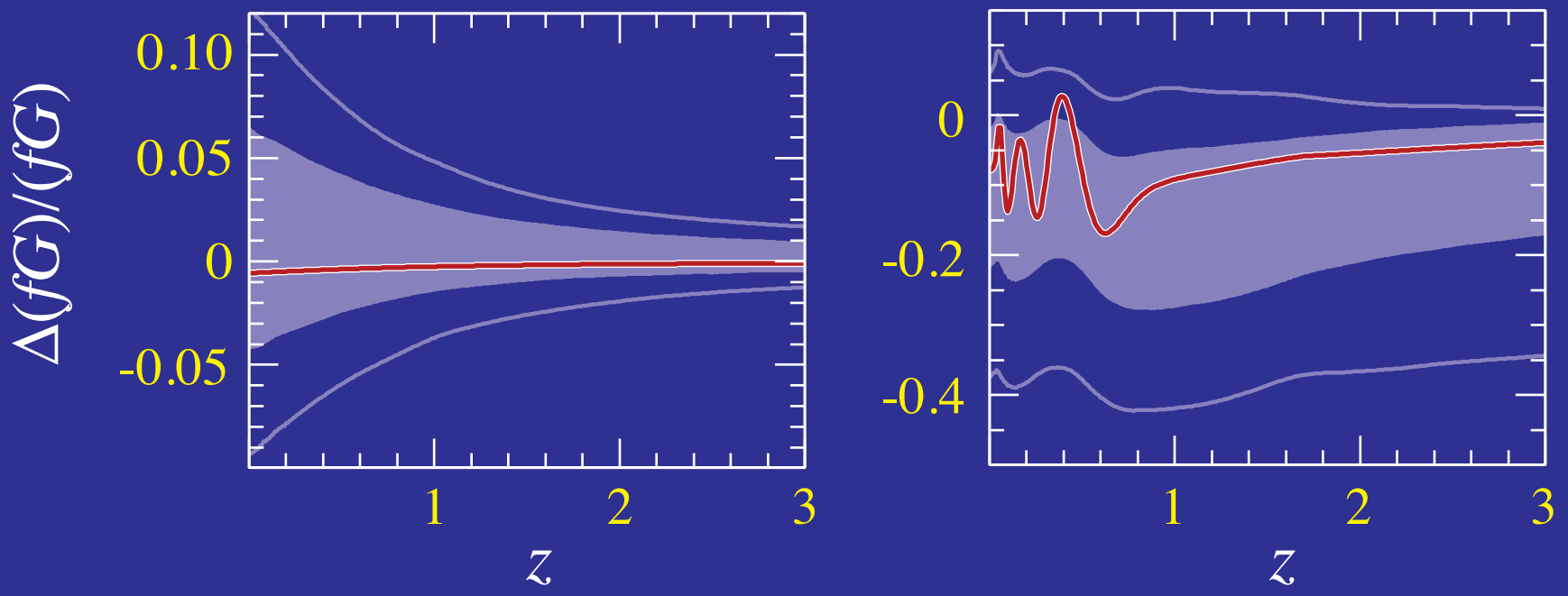
Redshift Space Distortion

- Redshift space distortions measure fG or $f\sigma_8$
- Measurements in excess of ~5% of ΛCDM would rule out quintessence



Cosmological Constant

Quintessence

Mortonson, Hu, Huterer (2009)

Falsifiability of Smooth Dark Energy

- With the smoothness assumption, dark energy only affects gravitational growth of structure through changing the expansion rate
- Hence geometric measurements of the expansion rate predict the growth of structure
  - Hubble Constant
  - Supernovae
  - Baryon Acoustic Oscillations
- Growth of structure measurements can therefore falsify the whole smooth dark energy paradigm
  - Cluster Abundance
  - Weak Lensing
  - Velocity Field (Redshift Space Distortion)