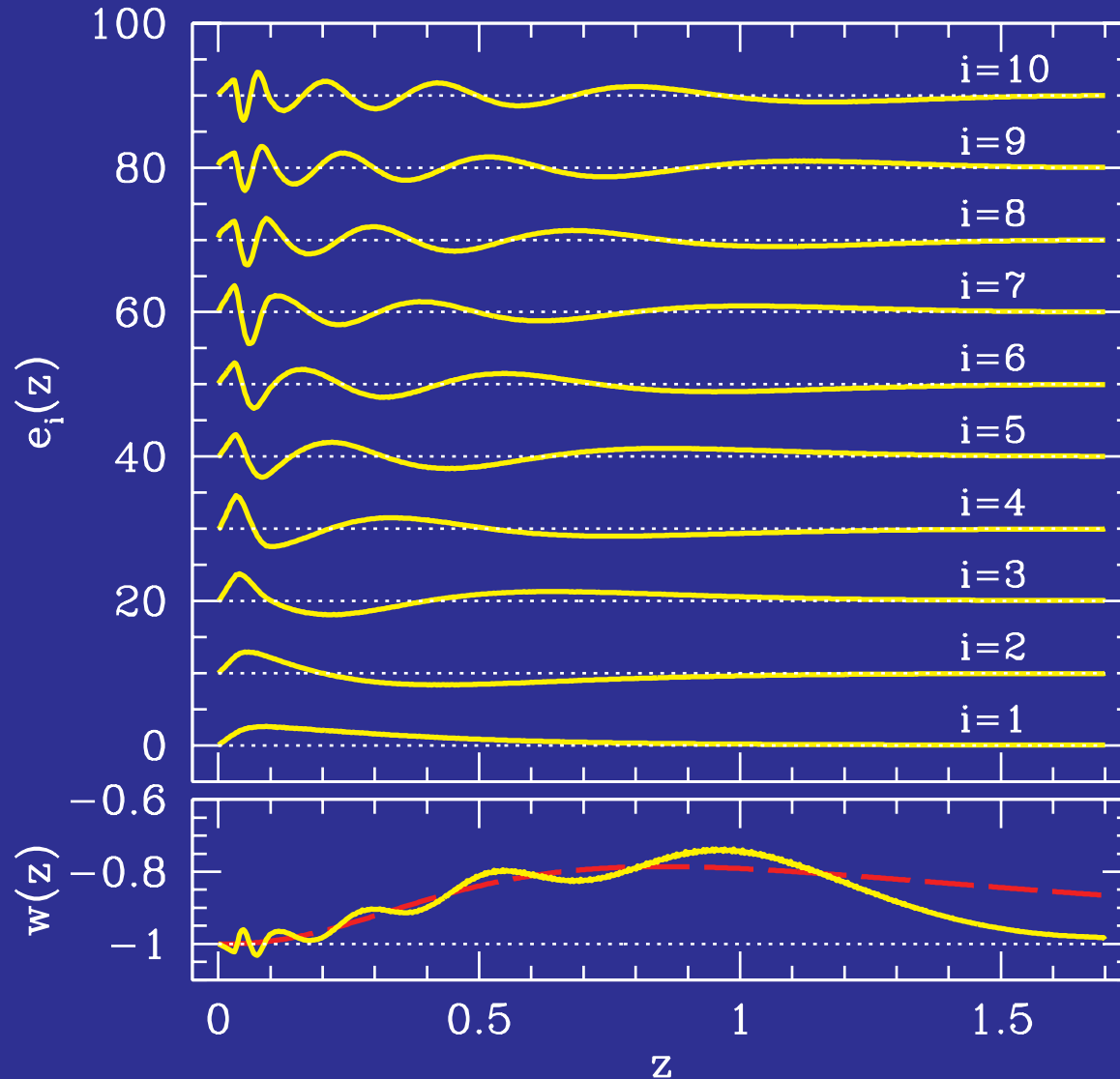


Equation of State PCs

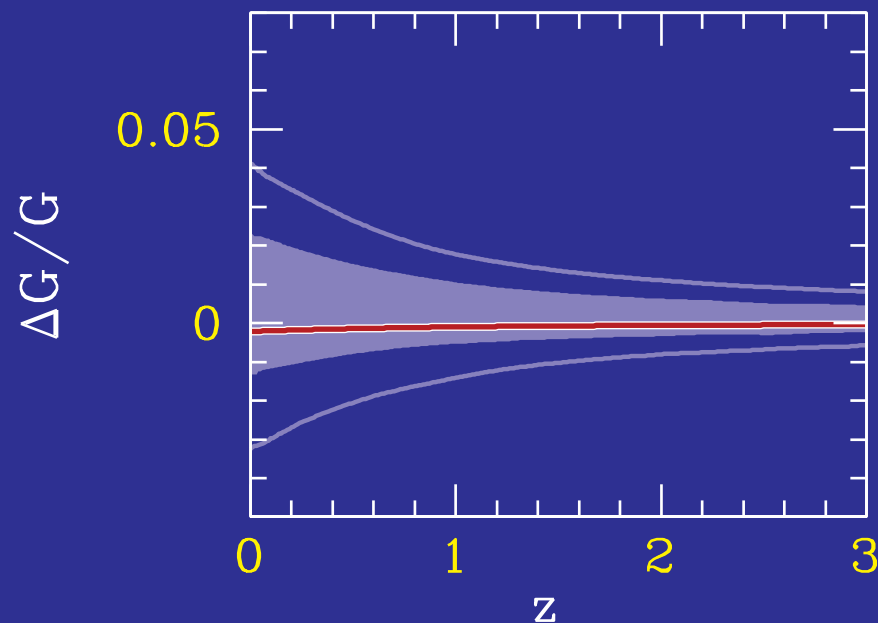
- 10 PCs defined for StageIV (SNAP+Planck) define an observationally complete basis out to $z=1.7$



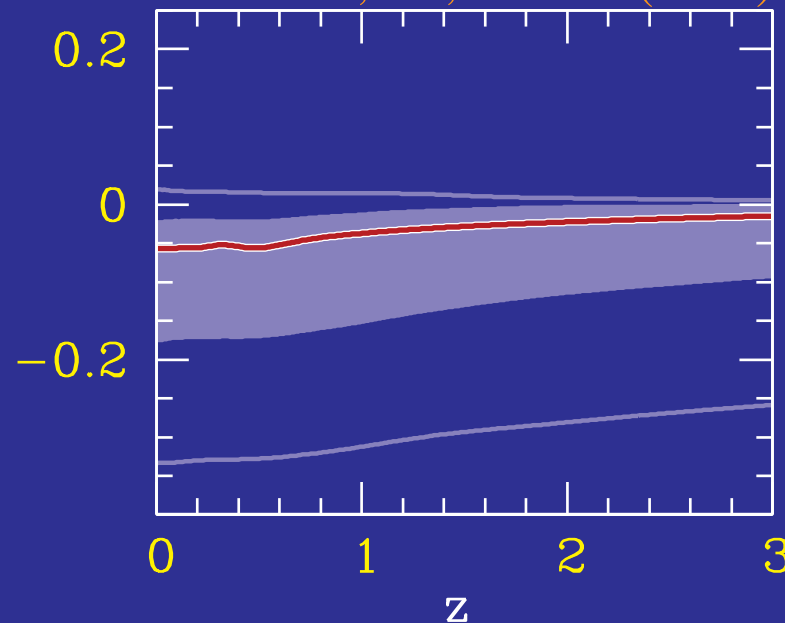
Falsifying Quintessence

- Dark energy slows growth of structure in highly predictive way

Mortonson, Hu, Huterer (2009)



Cosmological Constant



Quintessence

- Deviation significantly $>2\%$ rules out Λ with or without curvature
- Excess $>2\%$ rules out quintessence with or without curvature and early dark energy [as does $>2\%$ excess in H_0]