Value of Local Measurements

- With high redshifts fixed, the largest deviations from the dark energy appear at low redshift $z \sim 0$
- By the Friedman equation $H^2 \propto \rho$ and difference between $H(z)$ extrapolated from the CMB $H_0 = 37$ and 72 is entirely due to the dark energy in a flat universe
- With the dark energy density fixed by H_0, the deviation from the CMB observed D_* from the ΛCDM prediction measures the equation of state (or evolution of the dark energy density)

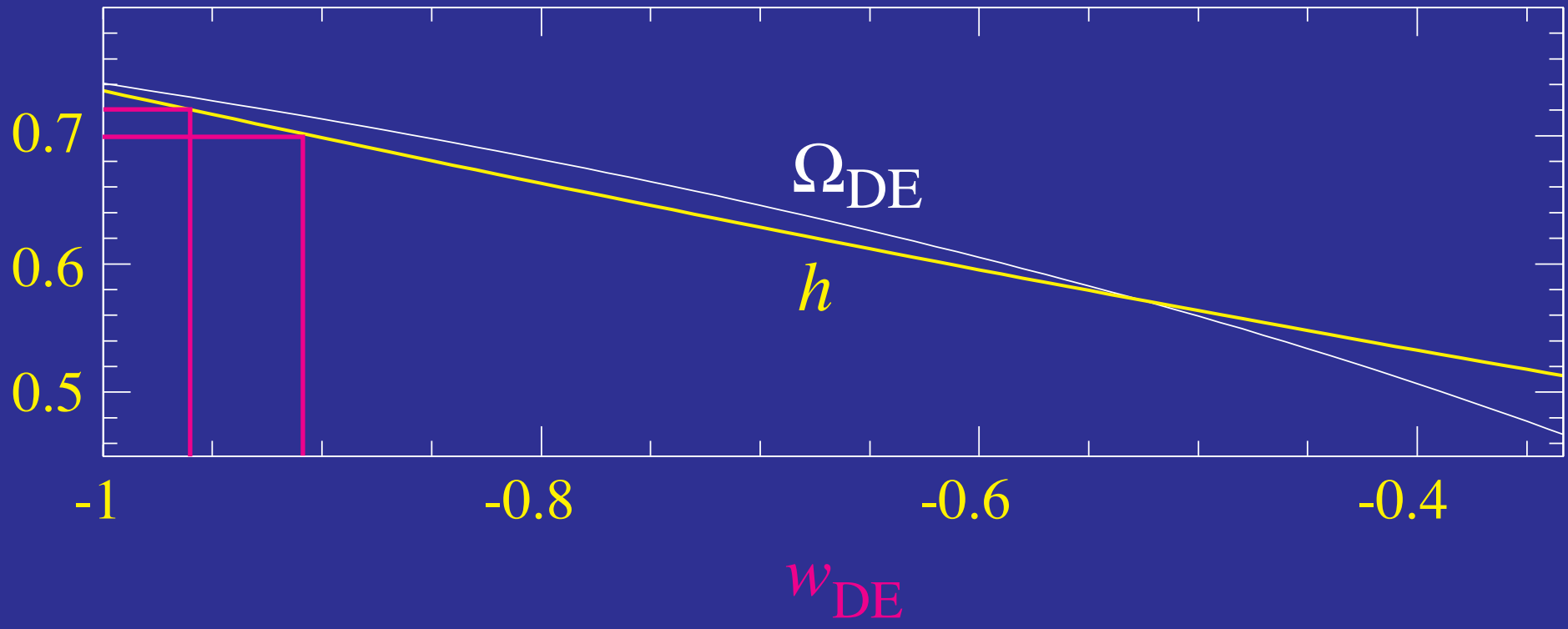
$$p_{\rm DE} = w\rho_{\rm DE}$$

- Intermediate redshift dark energy probes can then test flatness assumption and the evolution of the equation of state: e.g.

$$w(a) = w_0 + (1-a)w_a$$

H_0 = Dark Energy

- Flat constant w dark energy model
- Determination of Hubble constant gives w to comparable precision



- For evolving w, equal precision on average or pivot w, equally useful for testing a cosmological constant