Chapter 6
Geometry

Expansion History of the Universe

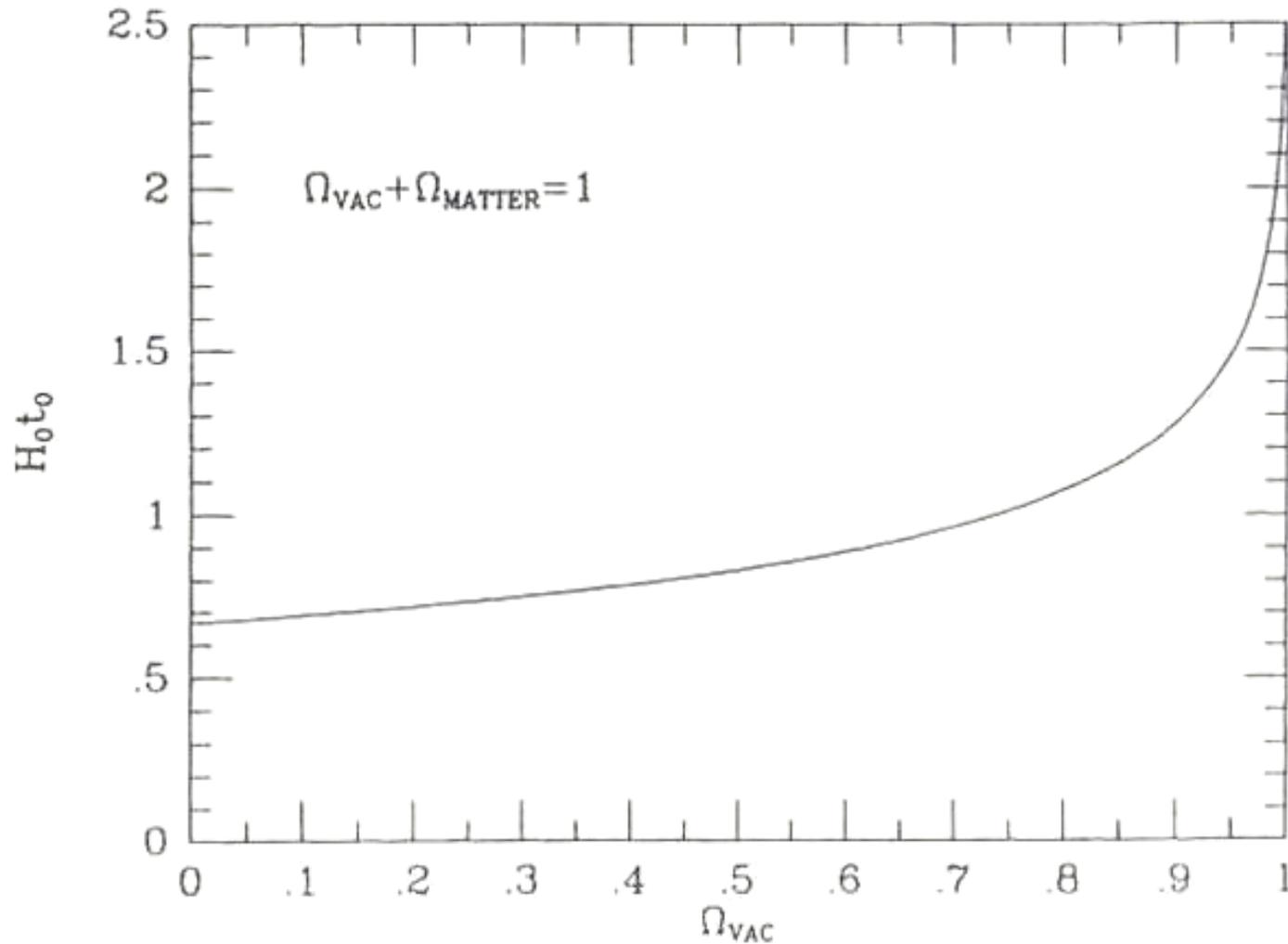Perlmutter, Physics Today (2003)

Age of the universe - II
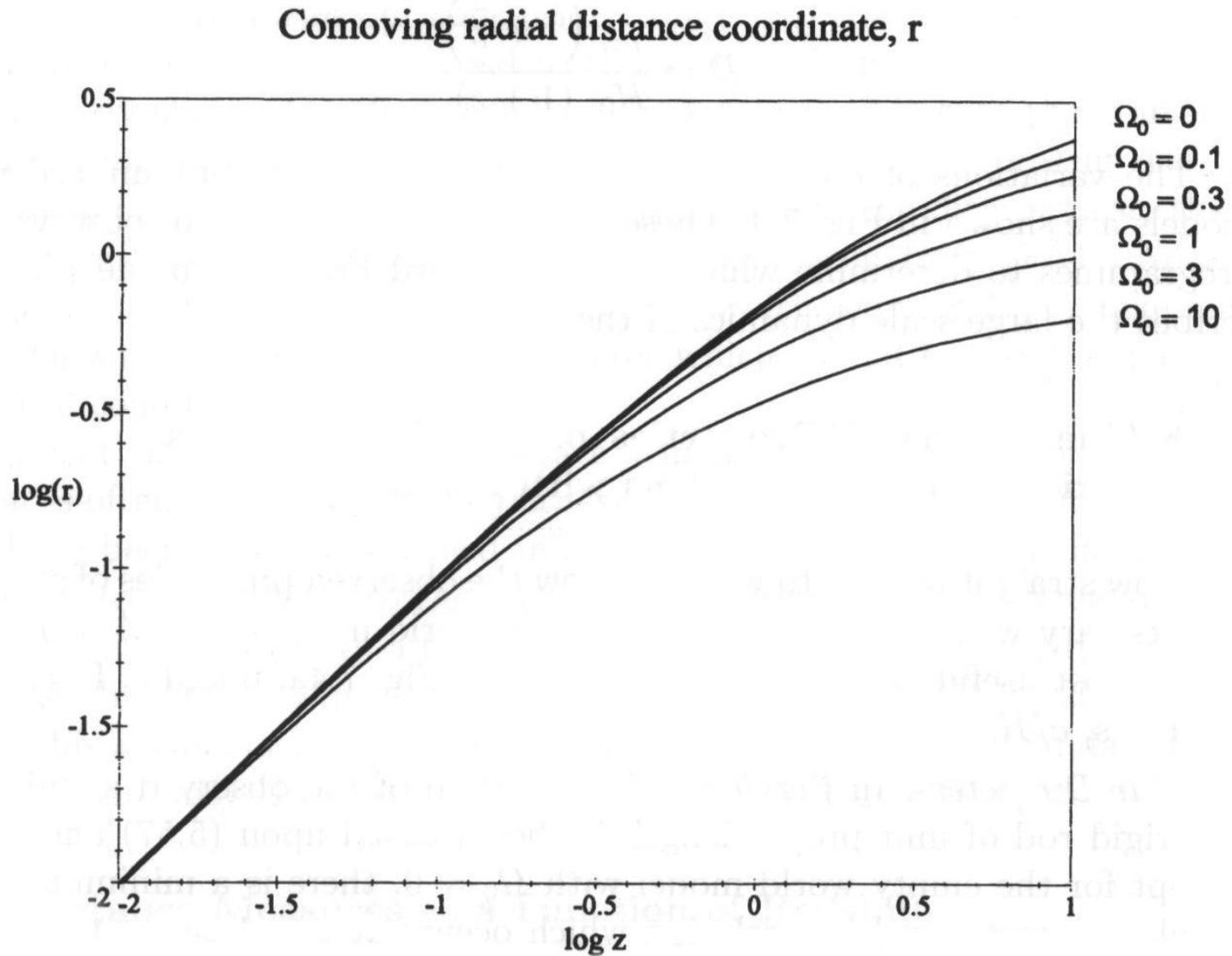
age becomes smaller with increasing Ω_m and Ω_r
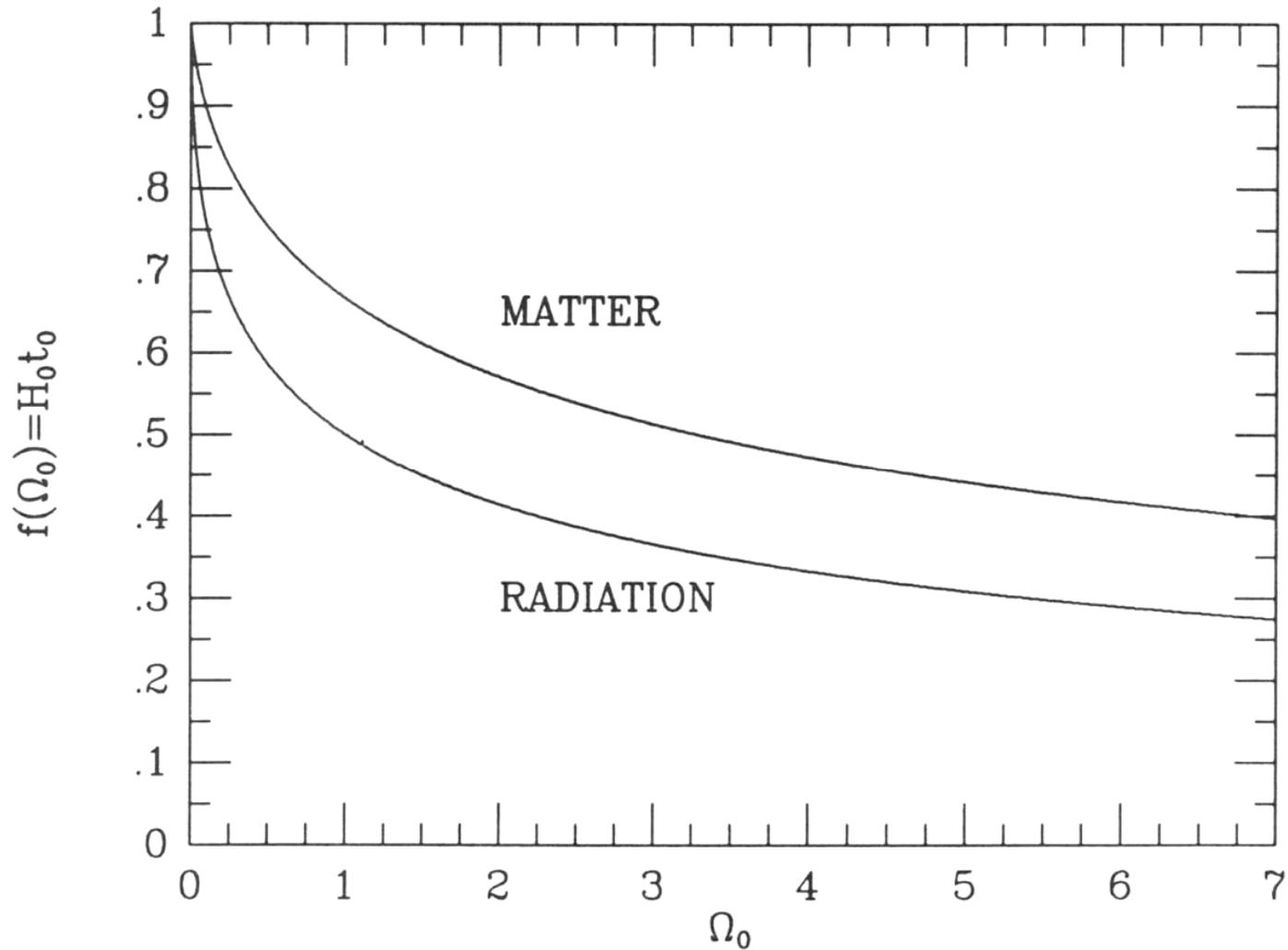
Age of the universe - I

age becomes larger with increasing Ω_Λ
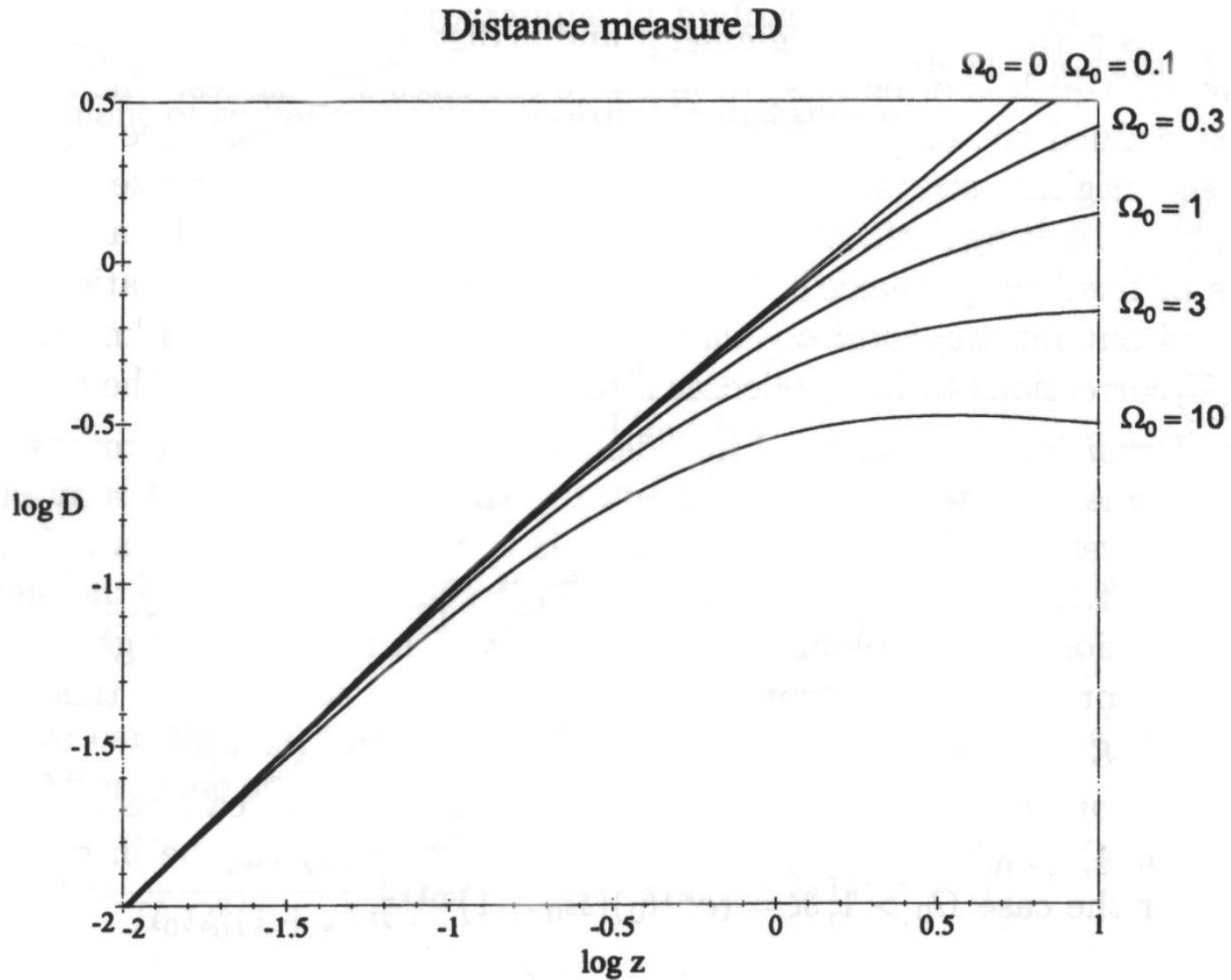
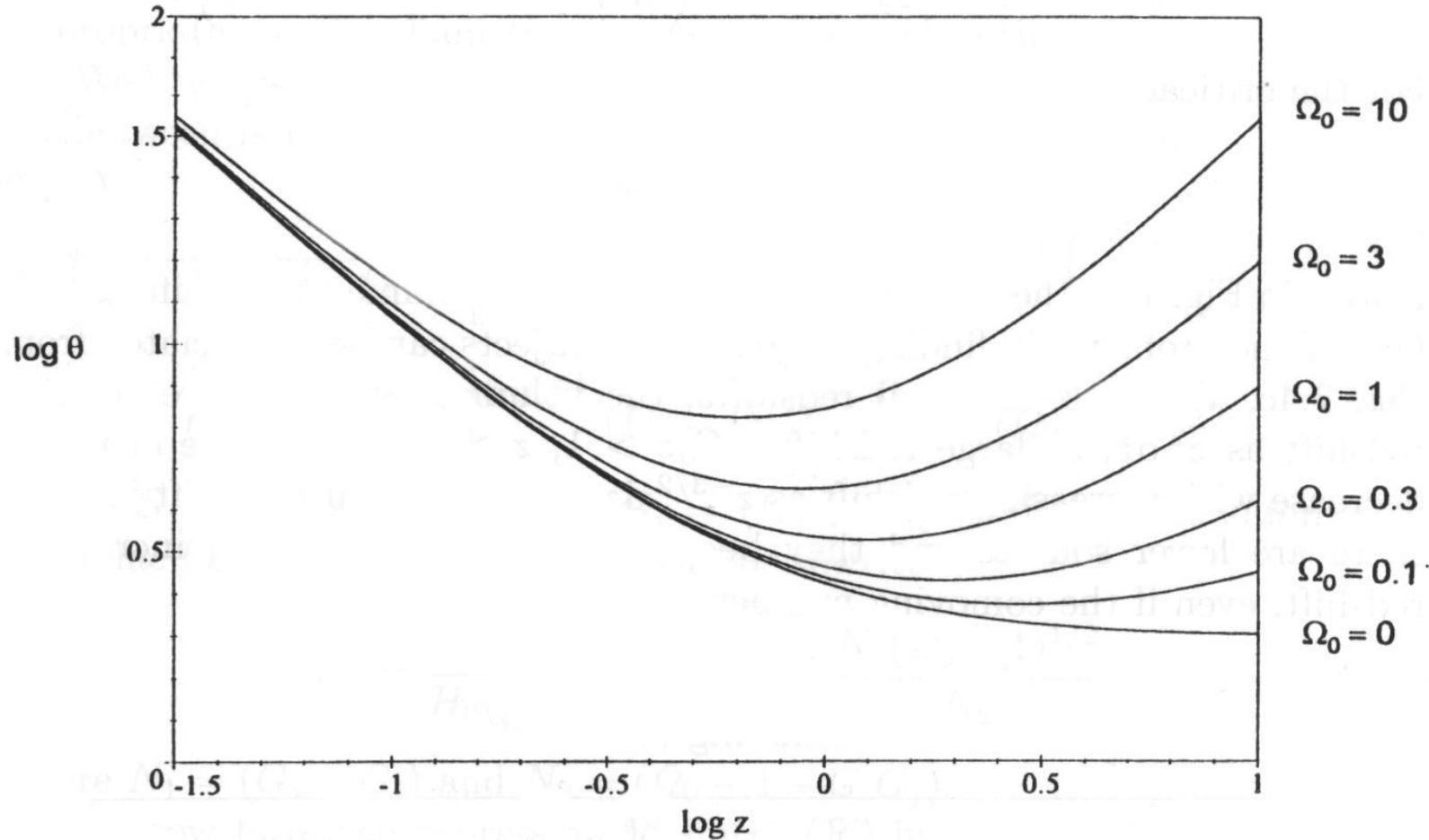# Angular size and luminosity diameter I

Comoving radial distance coordinate, r

Angular size and luminosity diameter II
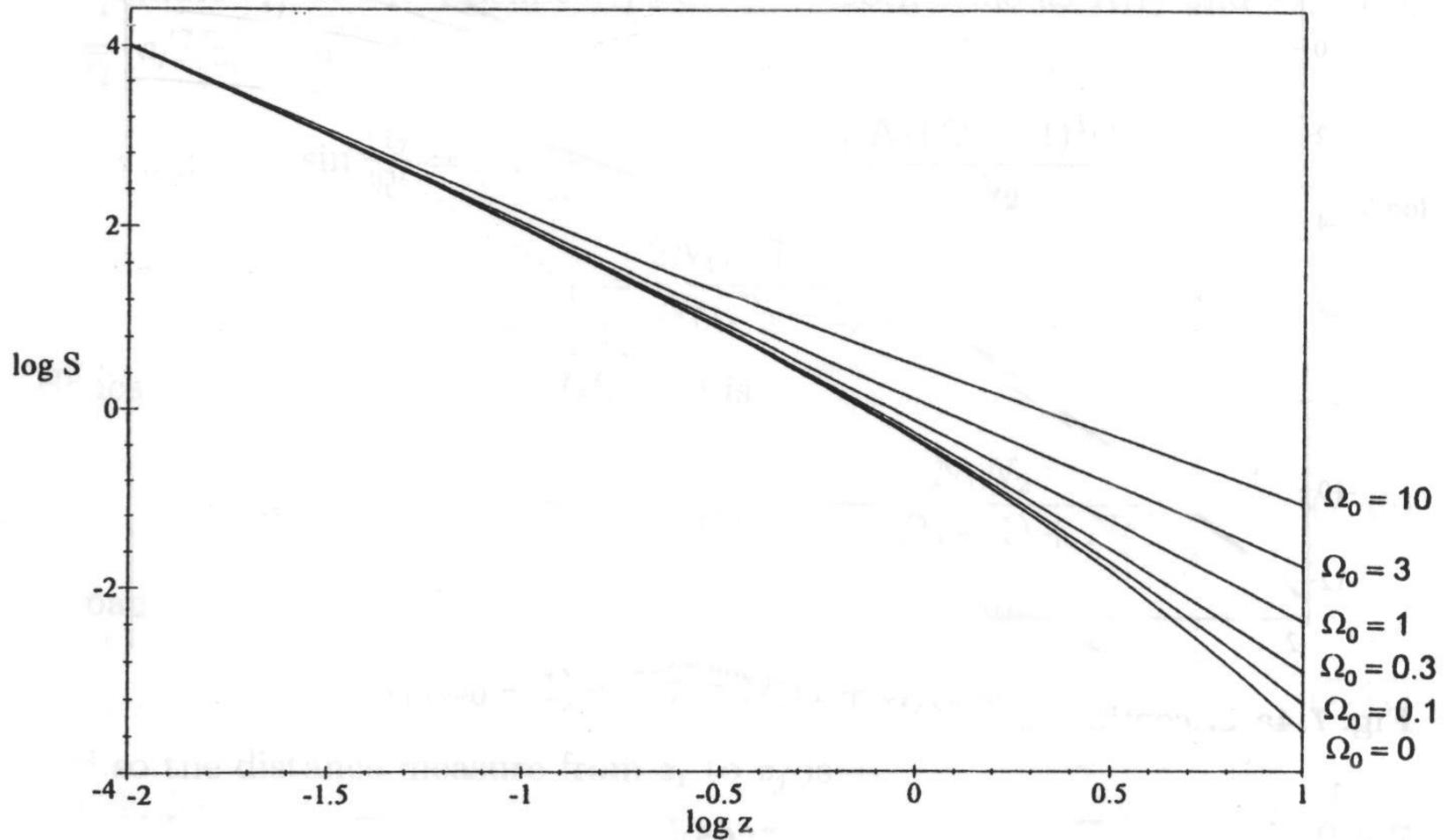

Distance measure D

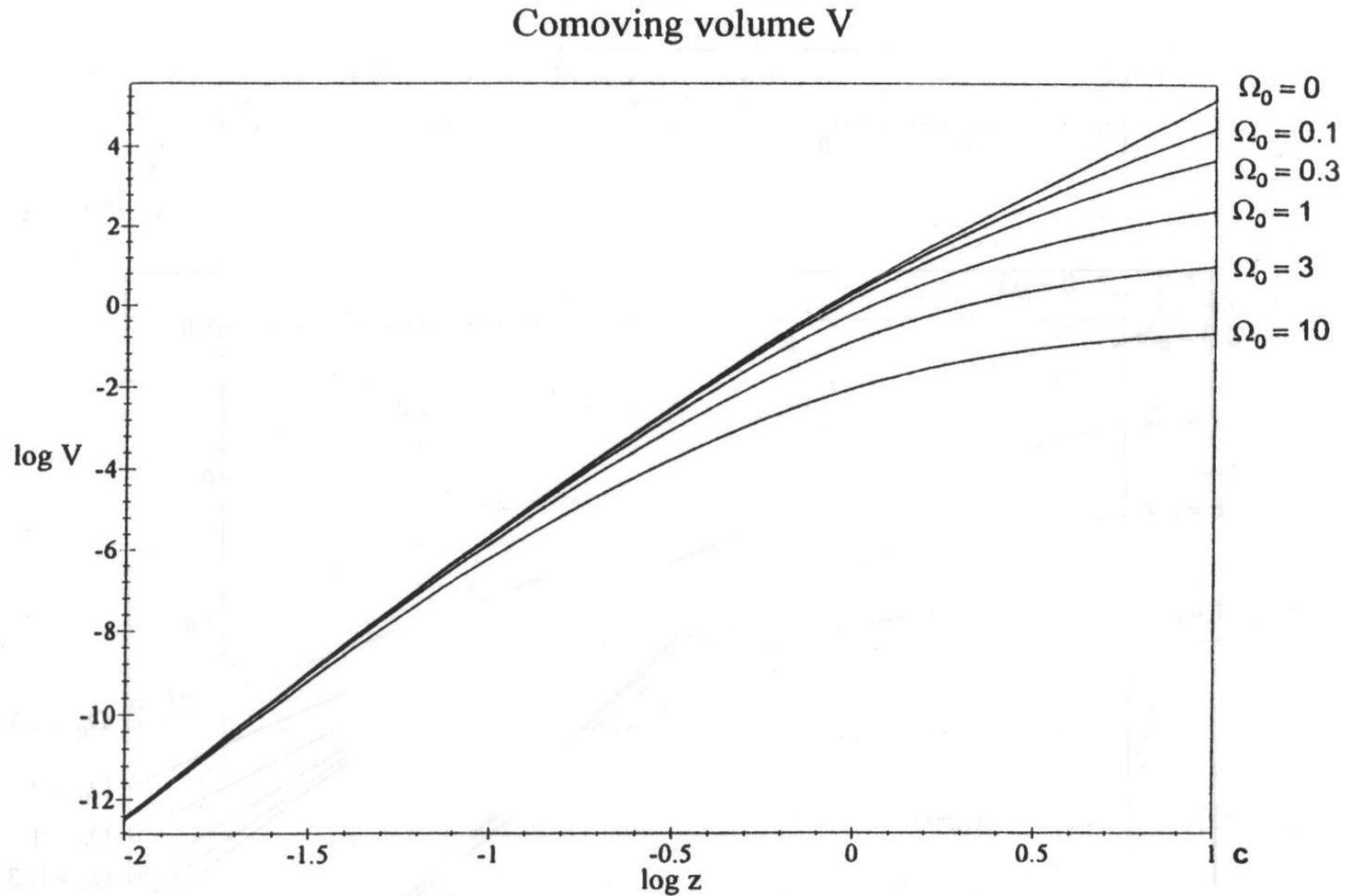# Angular size and luminosity diameter III

Angular diameter-redshift relation

Angular size and luminosity diameter IV

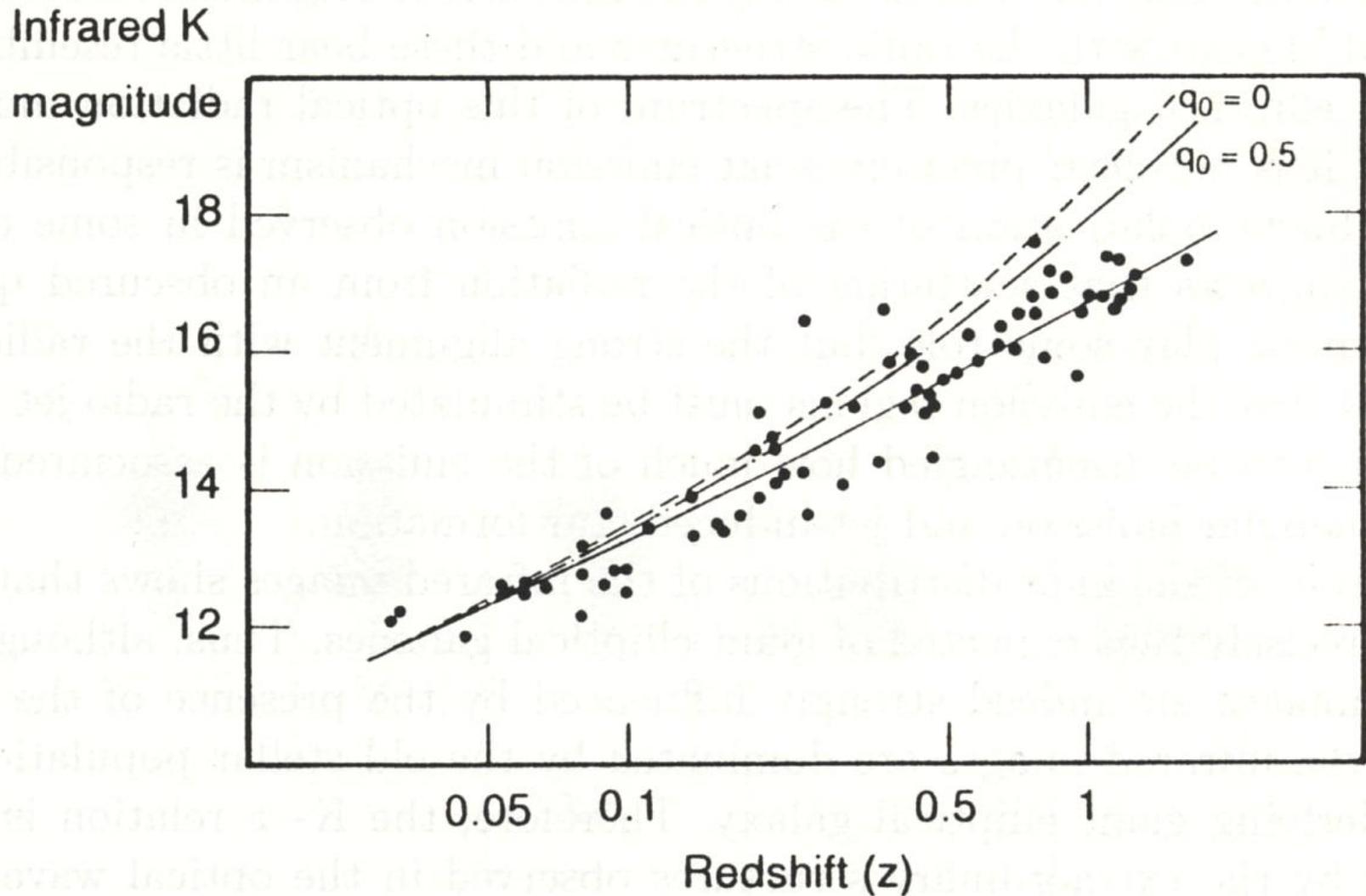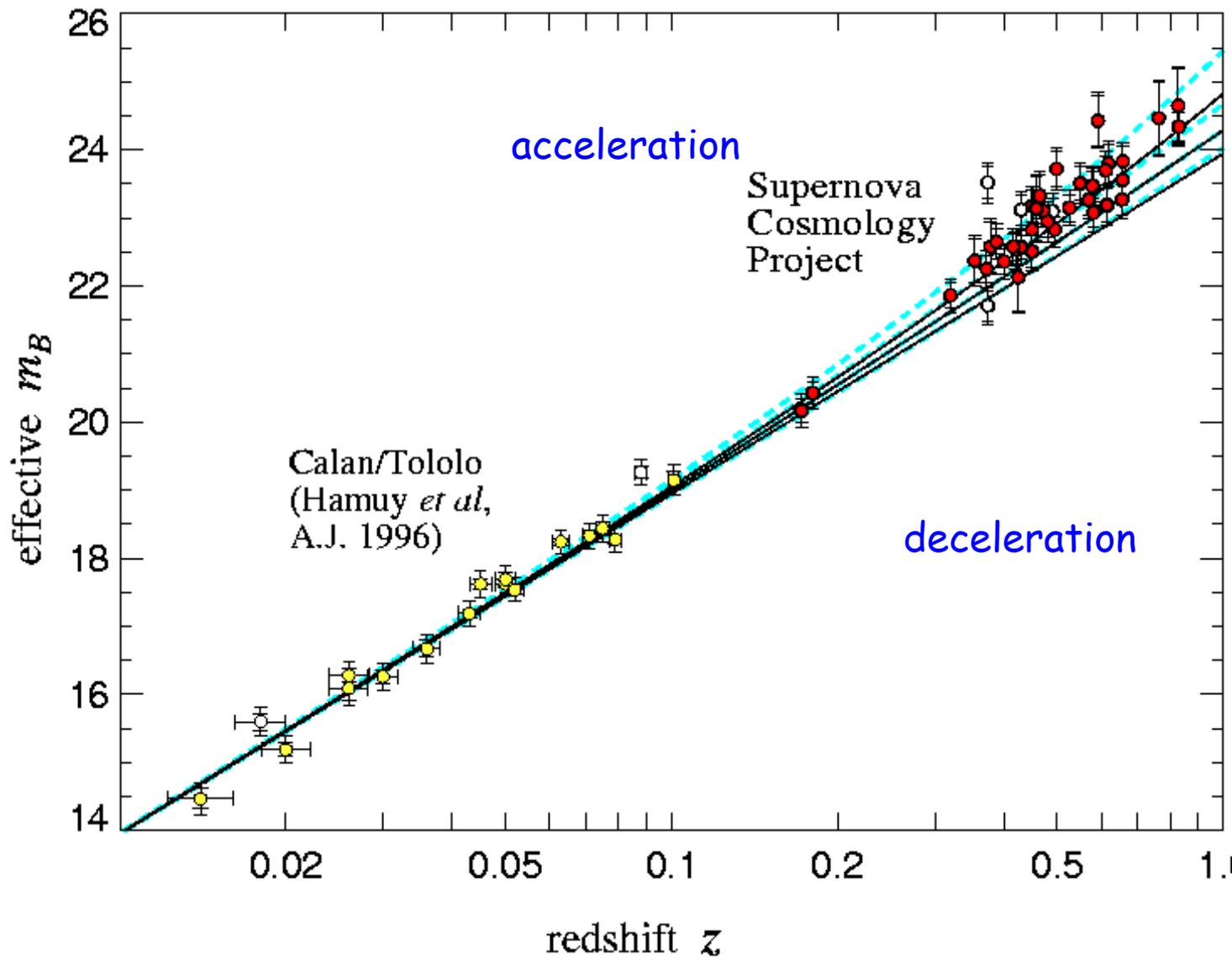
Flux density-redshift relation

Comoving volume V

Testing q_0 with galaxies

Testing q_0 with supernovae

fainter (log)

effective m_B

acceleration

Supernova Cosmology Project

Calan/Tololo (Hamuy *et al*, A.J. 1996)

deceleration

redshift z

Testing q_0 with supernovae

HST: Feb 2004
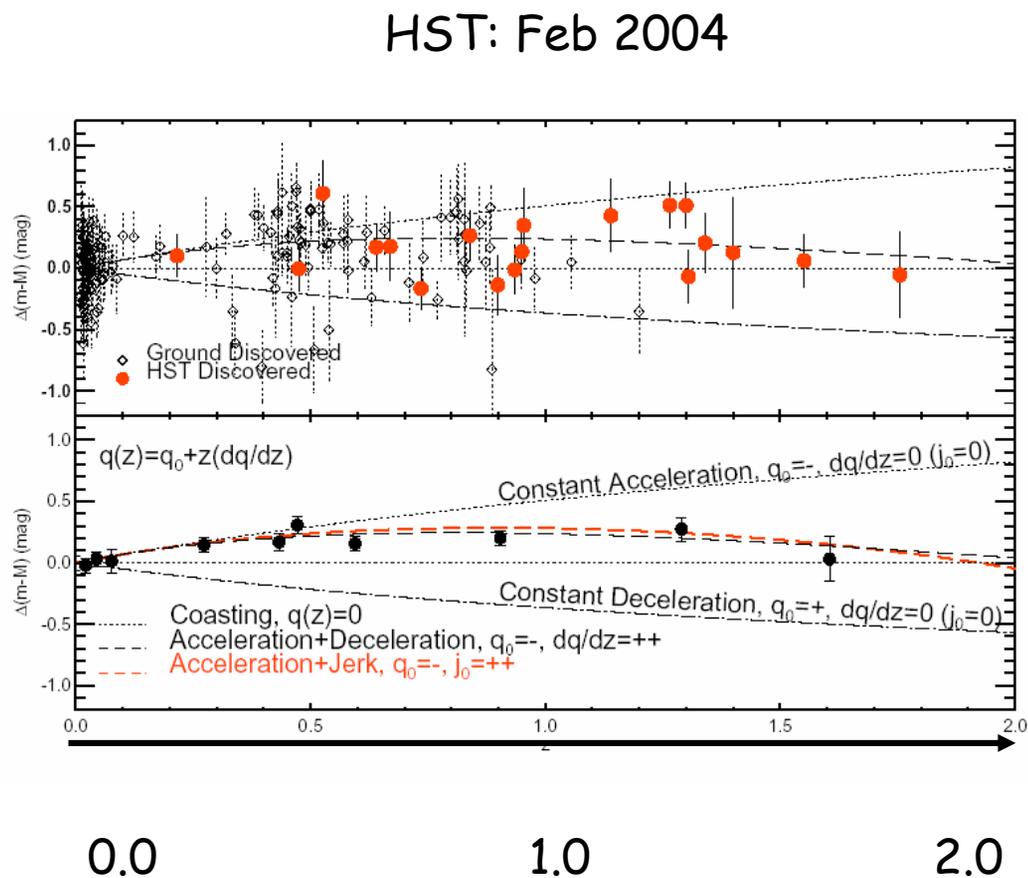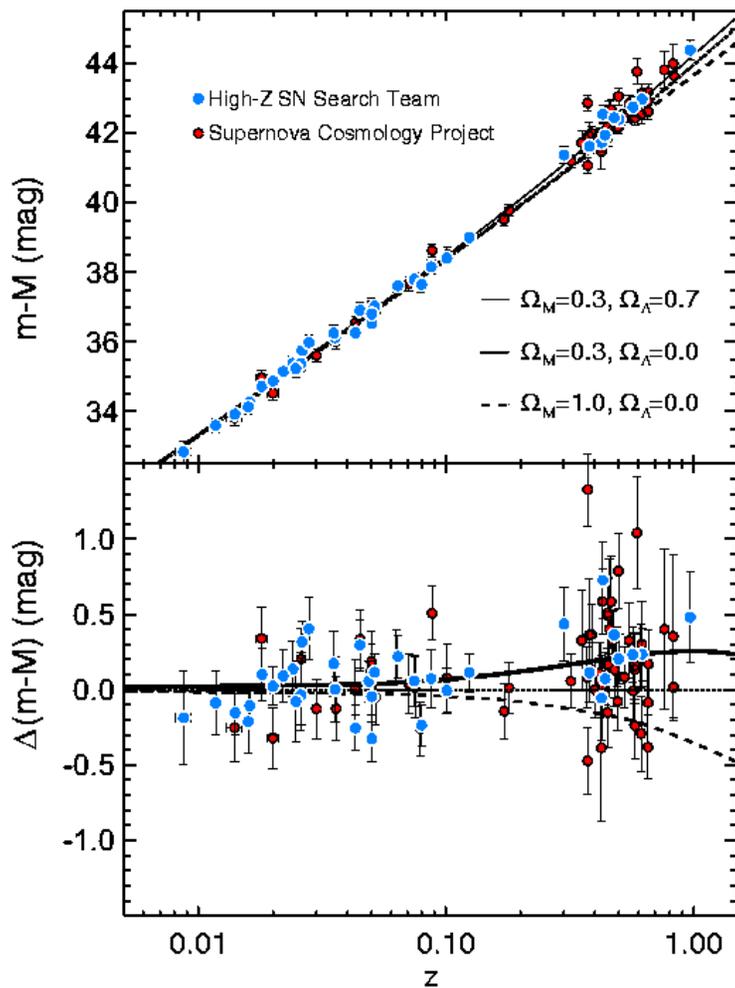
Testing q_0 with angular sizes