

XXVIII. Compare the Theoretical Magnitude-Redshift to Perlmutter 1999 SB 1A

Theoretical Apparent Magnitude-Redshift Relation (Mukhanov)

Physical Foundations of Cosmology, Mukhanov, Equations 2.78 and 2.81

$$\chi_{em}(z, \Omega_m) := \int_0^z \frac{1}{\sqrt{\Omega_m \cdot (1+z\xi)^3 + (1-\Omega_m)}} dz\xi \quad \Phi^2(\chi_{em}) = \begin{cases} \sinh^2 \chi, & k = -1; \\ \chi^2, & k = 0; \\ \sin^2 \chi, & k = +1. \end{cases}$$

Note: For k=0

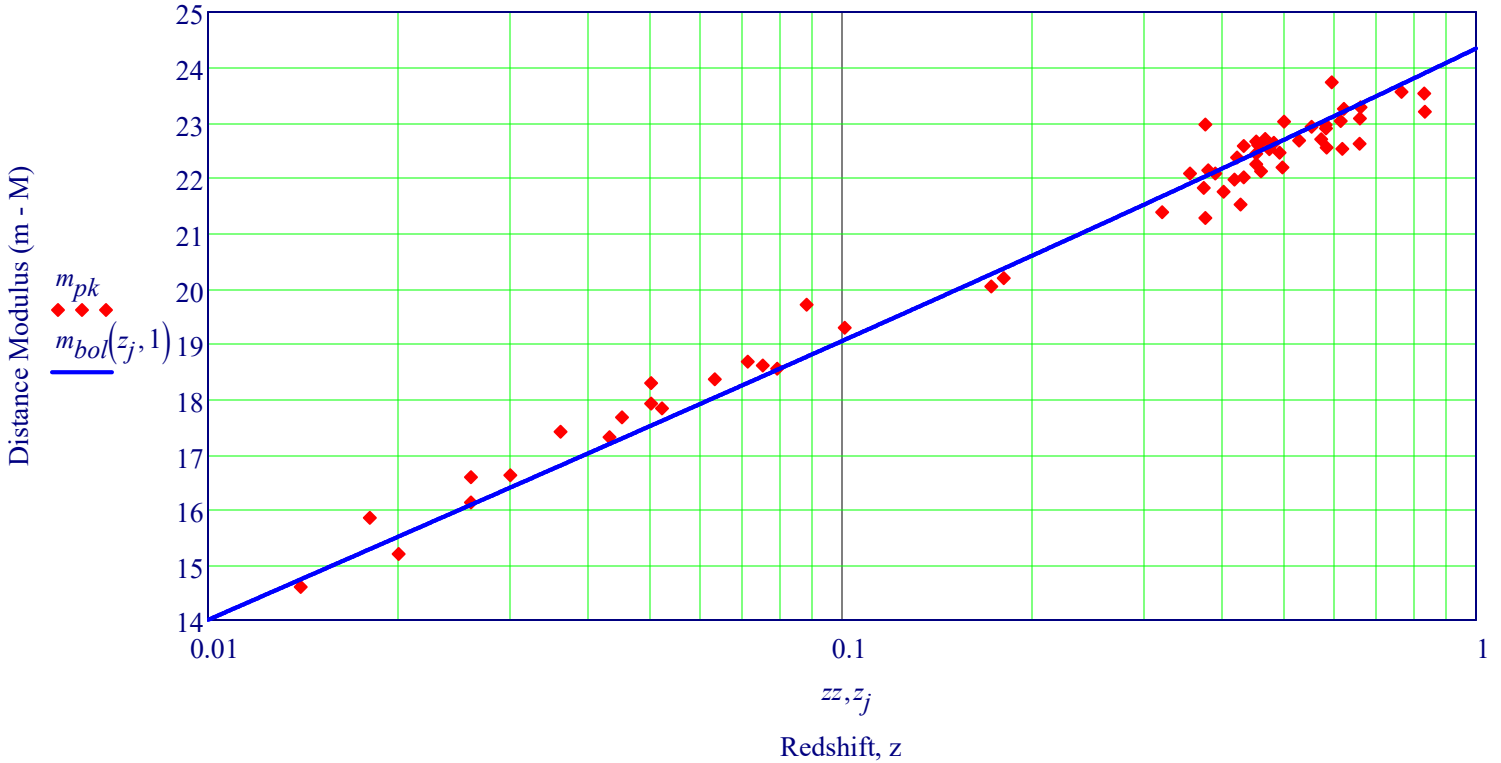
Then the Theoretical Bolometric Magnitude for k=0 is Given by:

$$\Phi(\chi_{em}) = \chi_{em}$$

$$m_{bol}(z, \Omega_m) := 5 \log(1+z) + 5 \log(\chi_{em}(z, \Omega_m)) + 24$$

$$j := 0..300 \quad z_j := 10^{0.01 \cdot j - 3}$$

Compare Theoretical to Supernova Type 1a Measurement - Effective Magnitude vs. Redshift (z)



z