

Assume the rate of expansion is increasing.

$$\dot{r} = \dot{r}_0 + \varepsilon t$$

Integrate the distance the light traveled from a distant nova that emitted the high redshifted light in the distant past.

$$\begin{aligned} d(T) &= \int_{-T}^0 \dot{r} dt \\ &= \int_{-T}^0 (\dot{r}_0 + \varepsilon t) dt \\ &= \left[ \dot{r}_0 t + \frac{\varepsilon t^2}{2} \right]_{-T}^0 \\ &= 0 - \left[ \dot{r}_0 (-T) + \frac{\varepsilon (-T)^2}{2} \right] \\ &= \dot{r}_0 (T) - \frac{\varepsilon (T)^2}{2} \end{aligned}$$

So it seems that the distance should be *less* than “expected” from linear extrapolation if the rate of expansion is increasing.