Gravitational Redshift

Distance $D_{qe} = \text{constant (no Doppler Effect)}$. 

Observer on Earth

Light Emitted

A Huge Quasar
1. Each satellite broadcasts radio signals with their location, statuses, and precise time information.

2. GPS radio signals travel at the speed of light ~ 300,000 km/h.

3. GPS device receives radio signals, noting their exact time of arrival and uses these to calculate its distance from each satellite it can see.

4. Once a GPS receiver knows its distance from at least 4 satellites, it uses geometry to determine its exact location on Earth in 3D.
Gravitational Redshifts in Cosmology
What do CMB photons encounter along their path?
Gravitational Redshifts in Cosmology