

Astronomy 622 - Debate presentation about cosmological constant
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Subject of my presentation: determination of Hubble constant using Supernovae Ia type

Abstract

It has been known that Supernovae Ia type produces consistent peak luminosity. Therefore they are often used to as secondary standard candle to measure the distance to their host galaxies.

Determination of H_0 (Hubble constant) using Supernovae Ia is determination of H_0 using distance and velocity of supernovae Ia. Therefore it is important to determine the distance accurately since redshift could be determined quite accurately recently.

In the paper (Riess, A.G., et al, 2009, AJ, 699, 539-563), they have observed 240 Cepheids distributed across six recent hosts of SNe Ia and using them to directly calibrate the peak luminosities of SNe Ia. And they find $H_0=74.2 \pm 3.6 \text{ km s}^{-1} \text{ Mpc}^{-1}$, within 4.8% uncertainty including both statistical and systematic errors.

Therefore subject is how they use Supernovae Ia to get H_0 and how they reduce error to get distance.

References

- Riess, A.G., et al, 2009, AJ, 699, 539-563
Colgate, S. A., 1979, AJ, 1, 232