THE VALUE OF H_0 FROM THE TF DIAMETER RELATION

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Our KLUN sample (6600 spirals) is presently the largest homogeneous catalogue for using the Tully-Fisher (TF) relation as distance indicator, to study both the Hubble constant and peculiar velocities at the scale of the local Universe up to z=0.025.

Due to the internal dispersion of the distance criterion, and the flux limitation of every catalogue, the Malmquist bias leads to a progressive under-estimation of derived distances d_{TF}. Moreover, objects with different $logV_m$, different Galactic extinction correction, different opacity correction, different morphological type or mean surface brightness consist in different classes with respect to the bias behaviour against true distance. The normalized distance (d_n) method, by superimposing the different bias curves corresponding to theses different classes of objects in the same diagram $logH = log(V/d_{TF})$ vs. d_n, allows us to visualize the unbiased part of the sample, which appears as a plateau at short d_n. Moreover, the use of morphological types or mean surface brightnesses as additional parameters has reduced the TF scatter by 30%, and then extended the unbiased range up to farther distances. The zero point variations of the TF regression with type or brightness is physically explained by the variation of the mass ratios of the different components constituting a spiral galaxy (Theureau et al. 1997, A&A 319, 435; Theureau 1997, A&A in press).

The slope of the TF relation is estimated through an iterative way from the data of the unbiased domain. The absolute zero point is fixed using a set of cepheid distances collected from literature (mainly from the HST project). From the unbiased domain of our field galaxies sample, we derived $H_0 = 55 \pm 5$. The new absolute calibration of the Period-Luminosity relation provided by HIPPARCOS parallaxes (Paturel et al. 1997, MNRAS in prep) leads to a 10% smaller value of $H_0 = 49 \pm 6$. This is a global value in perfect agreement with the result derived from SNIa standard candles which reach z=0.1 (Theureau et al. 1997, A&A 322, 730).

K. Sato (ed.), Cosmological Parameters and the Evolution of the Universe, 71.