of uniform expansion provides a mapping of the deviations from smooth Hubble flow over the volume delimited by the sample, $cz < 7500 \text{ km/s}$. We present the preliminary results of the analysis of our sample alone and in combination with others available in the literature providing full-sky coverage and discuss the implied motions in comparison with those of other surveys. Specific issues under consideration include the appearance of the quiet hubble flow region, the distances to clusters within the survey volume and the influence of the Pisces–Perseus, Hydra–Centaurus and Coma–A1367 superclusters and the Great Attractor.

The Cepheid Distance to NGC 5253: Calibration of $M(\text{max})$ for SNe Ia 1972E and 1895B

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The apparent V band distance modulus of NGC 5253, parent galaxy to the type Ia supernovae 1972E and 1895B, is $(m - M)_{AV} = 28.06 \pm 0.06$ mag determined from eleven Cepheid variables with unambiguous periods obtained with the Hubble Space Telescope. The internal reddening is zero to within $E(B - V) < 0.03$ mag determined from independent methods.

The absolute magnitudes of SN Ia 1972E are $M_V(\text{max}) = -19.53 \pm 0.12$, and $M_V(\text{max}) = -19.46 \pm 0.12$. The absolute magnitude of SN Ia 1895B is $M_B(\text{max}) = -19.69 \pm 0.21$, based on $B(\text{max}) = 8.4 \pm 0.2$ determined by correcting Walker's (1923) comparison stars to the modern photoelectric zero point in $B$.

Combining these data with the data for SN 1937C in IC 4182 determined earlier gives mean values of $M_B(\text{max}) = -19.55 \pm 0.08$ mag based now on three calibrations relative to Cepheids, and $M_V(\text{max}) = -19.58 \pm 0.09$ mag based on two Cepheid determinations.

Using the extant Hubble diagrams in B and V for SN Ia gives the absolute values of the Hubble constant as $H_0(B) = 52 \pm 8 \text{ km/s Mpc}^{-1}$ and $H_0(V) = 55 \pm 8 \text{ km/s Mpc}^{-1}$.

The quoted error is the external uncertainty assuming an intrinsic dispersion of 0.3 mag about the Hubble diagram for SN Ia.

Subject headings: Cepheids - distance scale - Galaxies: individual: NGC 5253 - Supernovae: individual: 1895B, 1972E

A Reanalysis of the Photometry of the Prototype Type Ia Supernovae: SN1937C

M.J. Pierce (NOAO/KPNO), G.H. Jacoby (NOAO/KPNO), E. Carder (NOAO/KPNO)

The historical type Ia supernova (SN Ia) SN 1937C plays a central role in the extragalactic distance scale controversy and the value of the Hubble Constant. The event was monitored extensively by Baade & Zwicky (1938) and it remains one of the best observed SN Ia events to date. It is one of only two SN Ia events in parent galaxies near enough for Cepheid searches with currently available technology. Sandage et al. (1993) recently reported a Cepheid distance modulus of $(m - M)_{AV} = 28.4 \pm 0.09$ to IC 4182, the host galaxy of SN 1937C. This distance sets the absolute luminosity for SN Ia events. When compared with photometry of more distant SN Ia, this luminosity leads to $H_0 = 50 \text{ km/s Mpc}^{-1}$ (e.g. Sandage & Tamman 1993), a value in contrast with estimates obtained from other methods (e.g. Jacoby et al. 1992). Subsequent analysis since 1938 has been limited to fitting the published data with template light curves (Leibandt et al. 1991) and zero point adjustments from modern photometry of nearby comparison stars (Schaefer 1995).

We have obtained the original photographic films of SN 1937C taken by Baade & Zwicky, including a series in V that was never published. The region on each film surrounding the supernova (including the comparison stars) was scanned with a PDS microdensitometer. We then compared the integrated photographic density of the standards to their known B and V magnitudes (via Schaefer's CCD photometry) to obtain a transformation curve. The photographic density of the supernova then yields B and V magnitudes through the transformation curve with a precision of 3 - 5%. We present an analysis of the light curve based on these data, including a discussion of the rate of decline and the implications to the determination of the Hubble Constant using type Ia supernovae.

At the conclusion of our study, we will make available tapes of the digitized images so that other investigators can examine our results.

Session 73: Astrometric Instruments and Results Display Session

Grand Ballroom

73.01

Automated Photographic Proper Motions: Selected Fields and Whole Schmidt Plates

D. J. MacConnell (CSC at STScI), W. J. Roberts (CSC at STScI)

Scanning of the POSS R-band plates of the northern hemisphere, completed recently at the STScI, together with the scans of the "Quick-V" plates taken for the HST Guide Star Catalogue, make possible the determination of proper motions of large numbers of stars in selected-target or survey modes. In the first mode, we have been obtaining motions for stars of kinematic and astrophysical interest as requested by several collaborators (H. Jahnke-ARI-Heidelberg; candidate nearby stars; J. Liebert - U. of Arizona; hot DAs from the Palomar-Green survey; M. Parthasarathy - Indian Inst. of Astrophys.; low-mass, post-AGB stars; P. Green - CfA: high-latitude carbon stars; Rex Saffer - sdO stars). We report on a test of the derived motions for a set of the Naval Observatory parallax program stars and discuss the completeness of the Luyten Two-Teenth Survey.

We have also searched for proper motions over entire POSS regions using an overlapping subplate technique. This method is very flexible in that it computes individual relative proper motions against several sets of reference stars, giving a thorough analysis of the errors and providing a check against spurious measurements due to statistical fluctuations. The method is vulnerable to cosmic and astrometric defects of the plates, and also fails for large proper motions. Using the existing plate archive it is possible to measure about one million previously unknown proper motions down to $\Omega = 35$ and $V = 17.5$. We present a comparison of our results for the region of the NGP with those of other work, and with another selected region near the galactic equator.

73.02

Astrometric Characteristics of the APS Catalog of POSS I

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A detailed analysis of the astrometric characteristics of the Automated Plate Scanner catalog of POSS I is presented. Internal estimates of the random catalog position errors are determined from our astrometric plate solutions and comparisons between the positions on O and E plates. An estimate of the systematic catalog position errors has been obtained by stacking residual maps from a large number of POSS I plates. External position error estimates have been determined using plate overlap regions and several different high surface-density astrometric catalogs. We find that our astrometric quality is sufficient for most applications for which APS POSS I catalog positions will be important.

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