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## Abstracts

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S166.33

**CCD VRI Photometry of Hipparcos Double Stars**

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A European Network was set up in order to perform coordinated observations with the aim to provide accurate photometric information for a large sample of visual binaries well distributed in both hemispheres. The southern part of this programme is performed within an ESO Key Programme on visual binaries.

Both CCD and conventional aperture techniques are being used in order to obtain precise multicolor photometry V, R, I for the components of selected double and multiple stellar systems. A specific profile fitting method was developed for the reduction of the CCD frames obtained for the closer systems (angular separations less than 12 arcseconds). An important by-product of the CCD photometry is the obtention of accurate relative astrometry down to about 0.01". Astrometric standard fields are observed for calibration purposes. The sample of double and multiple stars has been selected from the Hipparcos programme to maximize the scientific return thanks to the absolute astrometry provided by the ESA mission.

A new photometric database for double and multiple stars is being compiled upon most widely used photometric systems.

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**Astrometric Plate Reduction with Orthogonal Functions and Milli-arcsecond Accuracy in Deep Proper Motion Surveys**

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We are conducting a sample survey in UBV photometry and proper motions as part of an investigation of galactic structure and evolution. The programme is based on Schmidt plates (from OCA, Tautenburg, Palomar and ESO Schmidt telescopes) digitized with the MAMA machine (CAI, Paris). The high astrometric quality of the MAMA gives access to micronic accuracy leading to a few (2 milli-arcseconds per year) accuracy on proper motions with a 35 years time base. The high proper motion accuracy for faint star probes in wide-areas give access to the properties of star samples out of the solar neighbourhood (Soubiran 1993; Ojha et al. 1994a, 1994b). We have analyzed components of the UVW galactic space motions resulting from the accurate proper motion surveys. The kinematical distribution of F and G-type stars have been probed to distances of up to 2.5 kpc above the galactic plane. We have derived the constraint on the structural parameters of the thin disk and thick disk components of the Galaxy.

S166.35

**On the Improvement of Star Positions Determined by Use of the New Axial Meridian Instrument with Negligible Systematic Errors**

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The Nikolaev axial meridian circle (AMC) has an original scheme including the horizontal telescope with a circular pentagon before the objective (D=200mm, F=2500mm) in the prime vertical and an unmovable aligned vacuum collimator (D=180mm, F=12500mm). The best value of the horizontal flexure in the temperature range +14 °C – +22 °C is 0.090" ± 0.075". The collimation of the AMC is stable and can be described by the formula  $C = C' + a * t$  where  $t(C)$  is the temperature,  $a = 0.026" \pm 0.008"$  and  $C'$  is a constant. Trial observations of FK5 stars show variations of the AMC instrumental system not larger than 0.1". At present, the CCD micrometer for the AMC is being elaborated. The time delay integration mode and the so-called scanning method are used to detect and accumulate the photons from stars. First trials of the experimental micrometer were made with a 288 × 275 pixel CCD. According to their results, the AMC magnitude limitation with cooling has to be 15 and the positional accuracy of 0.1". Investigations are continuing. Finally, expected capabilities of the fully automatic Nikolaev AMC will permit to use it efficiently for improving the stellar reference frame and for its extension to fainter magnitudes.