DIRECT-PHOTOGRAPHY OBSERVATIONS WITH THE 2 M RCC TELESCOPE AT NAO-ROZHEN: CATALOGUE OF PLATES AND ARCHIVE-DATA ANALYSIS

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The 2m Ritchey-Chrétien-Coudé (RCC) telescope of the National Astronomical Observatory, situated in the Rozhen massif of the Rhodope Mountains, started operating in 1980 (for a detailed description of the telescope see Gutcke [1979]). Since then, 2000 direct photographs have been obtained, most of them covering a 1° x 1° area on the sky with resolution 12.9 sec/mm.

Recently, the data for the direct-photography observations have been organized as a computer-readable catalogue of plates, allowing quick information retrieval. We hope that the catalogue of plates will be useful for those who are interested in using observations from the Rozhen Observatory plate archive.

Each entry in the catalogue of plates contains the following information: plate number, equatorial coordinates of the plate centre, object or field designation, spectral band (UBVR system), photographic emulsion, plate dimensions, observation time (UT), exposure time, seeing, notes, and observer.

The data from the observations catalogue have been analyzed in order to derive some overall characteristics of the plate archive, e.g. the degree of observational activity, the preferred types of observed objects and the quality of observations. The catalogue data have also proved useful for the determination of the periods within a calendar year with most favourable observational conditions.

Since 1980, the 2 m Rozhen telescope has been used for direct photography during 449 observational nights, producing 1995 plates, or on average 4.5 plates per observational night. The total sum of the exposure time for the same period is 90781 min. (1513 h.), or 202 min. per observational night. Figure 1 shows the yearly number of plates and sum of exposure time for the entire period of the 2 m telescope operation (1980-1992). The gap for 1987 is due to the repair and test operations connected with the change of the telescope mirror by Carl Zeiss Jena. The decrease in the number of exposed plates for 1988-1992 is caused mainly by the increased application of electronic detectors.

Figure 2 shows the number of obtained plates for different types of observed objects. More than 85% of the 2 m telescope direct plates are photographs of extended objects: star clusters, nearby galaxies, and clusters of galaxies. The most commonly used types of photographic emulsion for the direct observations with the telescope are ORWO (75%) and KODAK (20%). The majority of observations are in the spectral band B (57%).

Figure 3 shows the number of plates for different exposure times. Only one third of all plates

H. T. MacGillivray et al. (eds.), Astronomy from Wide-Field Imaging, 371–375.

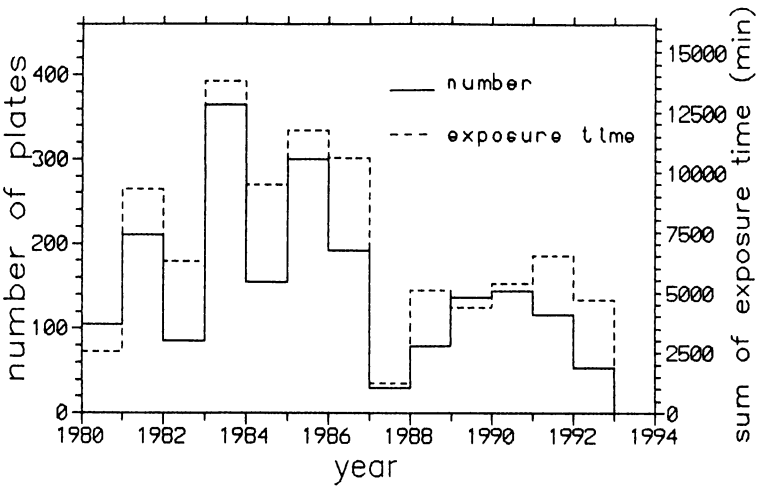

Figure 1.

have exposures longer than one hour, i.e. only comparatively small numbers of plates approach the limiting magnitude of the 2 m telescope, which is 21.5^m for B and 20.5^m for U and V. (The number of hypersensitized plates is not large.)

The information on plate quality is of major importance for potential users of the archive. Unfortunately, the telescope log book does not contain systematic and complete descriptions of the plate quality; one can only get some overview of it from the estimates of seeing, which is estimated visually at the telescope during the observations. The number of plates versus the seeing is shown in Fig. 4. Some 45% of all plates have seeing less than 3 sec.

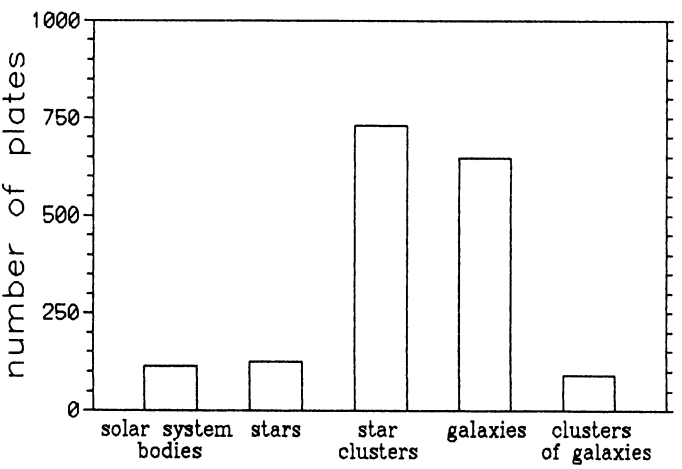

Figure 2.

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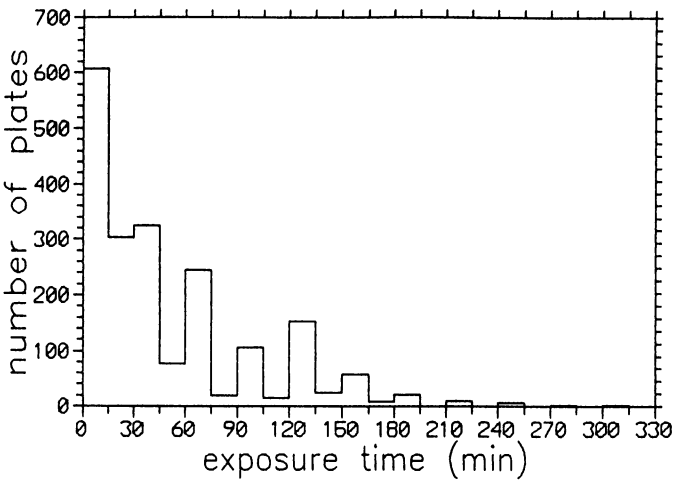

Figure 3.

The data from the plate catalog might allow us to detect seasonal effects on the observational activity at NAO-Rozhen. We may conclude from the distributions of number of plates by month (summed for 1980-1992) and the sum of exposure times, shown in Fig. 5, that most favourable for observations at NAO-Rozhen is the period June-November, and especially August-October. We have also found out that long periods of successive clear nights appear mostly in August-November.

In order to find out the periods with best seeing within a year, we have plotted in Fig. 6, by month, the fraction of plates with seeing less than 3 arcsec. It is seen that the probability of

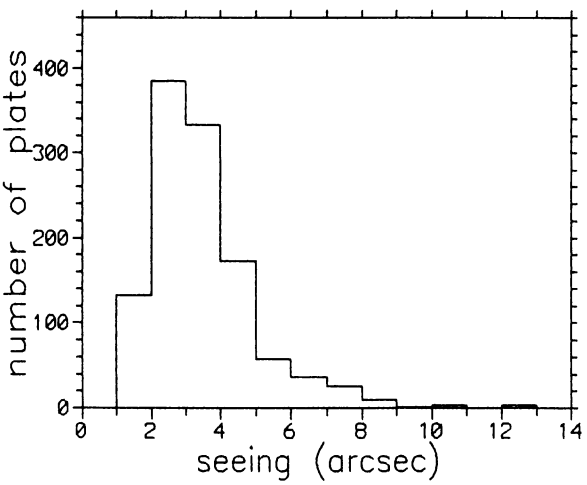

Figure 4.

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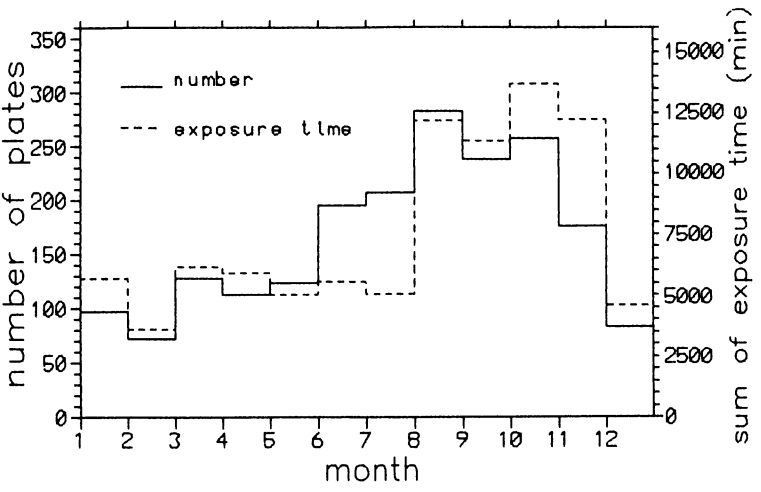

Figure 5.

observing at good seeing conditions is highest for the periods June-October, and, surprisingly, March-April.

Good-quality plates from the Rozhen Observatory archive may be used repeatedly in various investigations. However, the plate availability must be determined first, since most of the observers have not adhered to the 5 year proprietary period.

The catalogue of plates for the 2 m RCC telescope has been recently included in the Wide-field Plate Database (Tsvetkov et al. 1993), which will be accessible on line via the international data networks.

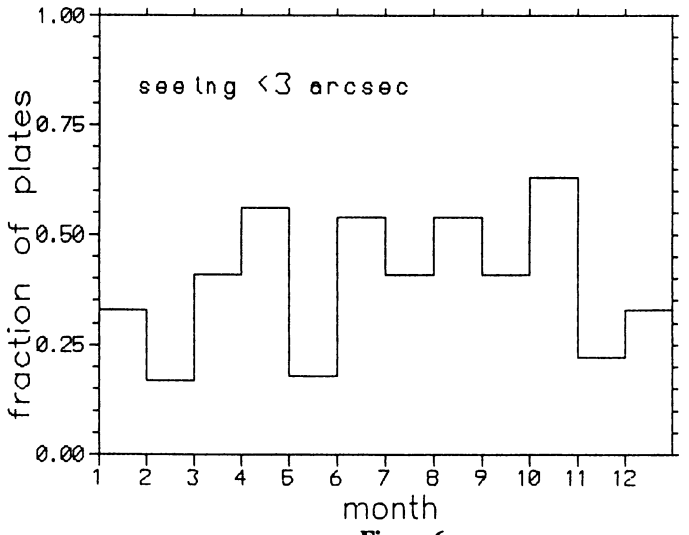

Figure 6.

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