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THE SPM OPEN CLUSTER SURVEY—YEAR 1

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For a long time now, star clusters have proved to be valuable probes of the structure and development of the Galaxy and beyond. However, many of the conclusions drawn from open cluster data have been, if not controversial, at least affected by considerable uncertainty. The main reasons for this situation are the lack of homogeneity of the present compilations of open cluster fundamental parameters (reddenings, distances, ages, metallicities), and the small number of studies for certain kinds of clusters (eg. old clusters and distant clusters). In this contribution, we introduce a UBVRI survey of open clusters that is being undertaken at the Observatorio Astronómico Nacional at Sierra de San Pedro Mártir (SPM - Mexico). Most of the clusters visible from SPM will be surveyed using the same instruments (telescope, CCD, filters) and reduction procedures. The survey will, therefore, provide a highly complete and homogeneous database of open cluster photometry.

Targets were selected from the new catalogue of open cluster data compiled by Dias et al. (2002), which lists information for 1537 clusters and is the most up-to-date catalogue of open clusters presently available. All clusters visible from SPM were selected ($\delta > -15°$), and objects with large angular diameters ($> 30'$) were left out. The final sample consists of about 500 clusters, of which half of them have not been previously studied.

To this moment, 131 clusters have been observed, all of them previously unstudied. For 43 we have the final calibrated photometry, and for 20 we have estimates of their reddenings, distances and ages. With the newly determined cluster parameters we have plotted in Fig. 1 the spatial distribution of the clusters projected on the Galactic plane (see caption for details). The cluster distribution shows that the old (> 1 Gyr) clusters are mainly outside the solar circle (> 8.5 Kpc from the Galactic center), in agreement with previous studies. However, we found that all the analyzed clusters located outside the solar circle

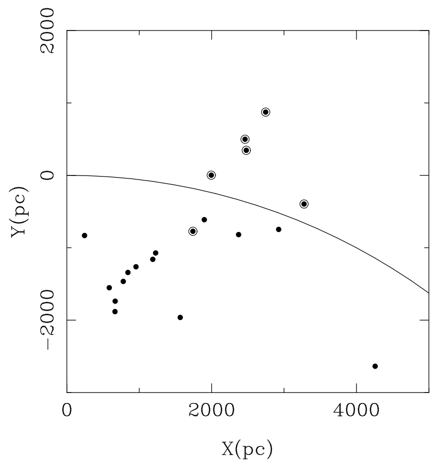

Fig. 1. Distribution of the 20 analyzed clusters projected on the Galactic plane. The X axis indicates the direction of Galactic rotation, Y points toward the Galactic anticenter and Z points to the north Galactic Pole. The sun is at (0, 0). The circle has a 8.5 Kpc radius and is centered at the Galactic center. The old clusters (> 1 Gyr) are marked with rings.

turned out to be quite old (> 1 Gyr). This result seems to indicate that there is a considerable number of old open clusters among the presently unstudied objects, contrary to earlier considerations (eg. Janes & Phelps 1994).

We anticipate that most of the remaining observations and data reduction will be accomplished in a 2–3 year period. We expect that the results of this survey will give a significant contribution to the understanding of the development and structure of the Galactic disk, as well as a valuable database of stellar photometry.

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