Dias et al. (2002) summary

Introduction

The paper, authored by W. S. Dias, B. S. Alessi, A. Moitinho, and J. R. D. L´epine, introduces a new catalogue of open clusters in the Milky Way. The motivation for this work stems from the significance of open clusters in investigating various aspects of the Galaxy, such as kinematics of star formation regions, Galactic structure (e.g., spiral arms, dynamics), and chemical abundance gradients in the disk.

The authors highlight the growth in available data on open clusters due to publications like the Hipparcos Catalogue and individual works utilizing CCDs for photometry and astrometry. They reference recent discoveries by various authors and contributions that determined mean proper motions and membership probabilities of clusters using Hipparcos, Tycho, and 2MASS survey data.

Despite the existing WEBDA database being a comprehensive open cluster resource, the authors identify limitations, such as separate files for each cluster, lack of updates with recent discoveries, and absence of systematic information on proper motions and radial velocities. Consequently, the authors compile a new catalogue to address these issues, consolidating data on open clusters' fundamental parameters, kinematics, and metallicity into a single file for ease of use. They believe this catalogue will be a valuable tool for diverse open cluster research. The paper outlines the contents of the catalogue and main reference sources, while Section 3 provides commentary on the newly included data.

2. The catalogue

The catalogue presented in the paper is constructed by amalgamating data from previous catalogues such as WEBDA, ESO Catalogue (Lauberts 1982), and Lyngå (1987). The basic parameters included are coordinates, age, apparent diameter, color excess, and distance. Additional data on kinematics and metallicity are incorporated where available, with references obtained from the Simbad database and literature searches.

The catalogue comprises a single list (Table 1a) of fundamental parameters and kinematical data, along with bibliographic notes. It covers 1537 open clusters, providing equatorial coordinates, angular apparent diameter, distance, color excess, age, mean proper motions, mean radial velocities, mean metallicity, and associated errors. A corresponding list (Table 1b) with positions and proper motions in galactic coordinates is also provided. Full bibliographic references are documented in a separate file (Table 2).

Approximately 94.7% of the objects have estimates of apparent diameters, while 37% have distance, color excess (E(B − V)), and age determinations. Regarding kinematic data, 18% have mean proper motions listed, 12% have mean radial velocities, and 9% have both simultaneously.

Visual inspections of DSS plates led to corrections in central coordinates for several clusters, such as Lynga 8, Stock 12, Stock 15, and vdB-Hagen 164. Some clusters cataloged in the RNGC as "non-existent" were found in the catalogue, marked as "recovered." Conversely, clusters noted as "non-existent" in the RNGC were identified as actual clusters, marked as "recovered."

A supplementary table (Table 3) provides information on clusters with available photometric data, listing observed bands with CCD, photomultipliers, and photographic plates. This table currently

covers UBVRI bands and will be expanded to include other commonly used photometric systems based on data collected from WEBDA and literature searches

3. Comments on new information and new data included

In the "Comments on new information and new data included" section of the paper, the authors provide insights into various aspects of the open cluster catalogue:

1. **Designations:**
    - The authors introduce an additional category called "Possible Open Cluster Remnant" (POCR), consisting of 34 objects at relatively high galactic latitudes ($b \geq 15^{\circ}$). These objects are interpreted as late stages in the dynamical evolution of star clusters.
    - The categories also include possible moving groups cataloged by Latysev and non-identified clusters.
2. **Kinematics:**
    - Recent investigations have led to the determination of mean proper motions for 280 objects and radial velocities for 182 objects, supplementing the catalogue with updated kinematic data.
3. **Fundamental parameters:**
    - The primary source for fundamental parameters (reddening, distance, and age) is the WEBDA database, drawing information from Lyngå (1987), Loktin et al. (2000), Dambis (1998), and Malysheva (1997).
    - Distances for clusters investigated by Baumgardt et al. (2000) were estimated using mean Hipparcos parallaxes of stars considered as members. The catalogue includes distances derived from mean parallaxes for specific clusters like Ruprecht 147, Stock 10, vdB-Hagen 23, and vdB-Hagen 34, all within 1 kpc. Additional parameters from isolated studies were also incorporated.
4. **Newly discovered open clusters:**
    - The catalogue features 191 clusters not present in previous catalogues, including those discovered by Platais et al. (1998) using Hipparcos data. These clusters, characterized as nearby and extended objects, contribute to the updated list.
    - Objects published as probable new open clusters in the ESO catalogue Lauberts (1982) are included (more than 100 clusters referred to as ESO-SC).
    - Loiano 1 is identified as a previously undetected open cluster of intermediate age through a photometric study of the surrounding stellar field (Bernabei & Polcaro 2001).
    - Alessi 1 to 12 are non-cataloged objects in the solar vicinity with recently determined fundamental parameters, confirming their locations at distances ≤ 1 kpc (Alessi et al. 2002).

4. Summary and conclusions

In summary and conclusion, the authors have presented a new catalogue of open clusters, incorporating revised data from old catalogues and recently published isolated papers. The primary aim of this catalogue (Table 1a) is to serve as an efficient tool for open cluster studies by consolidating all available basic data, including fundamental parameters and kinematics, into a single, user-friendly list. Regular updates are provided, and the latest version is accessible online. An alternative list (Table 1b) with positions and proper motions in galactic coordinates is also made available, catering to the potential use of the catalogue in selecting observational targets.

To enhance the usability of the catalogue in observational planning, an additional table (Table 3) is included, detailing open clusters with available photometric data. References to the data used in Tables 1a and 1b are provided in Table 2.

The current edition of the catalogue encompasses 1537 objects, with 356 not found in Lyngå's (1987) catalogue. Among these, 191 open clusters are published in the literature, and 11 are recently discovered, with fundamental parameters determined by the authors' group but yet unpublished.

While nearly all clusters (94.7%) have estimates of their apparent diameters, only 37% have distances, E(B − V), and ages listed. Kinematic data is less comprehensive, with 18% having mean proper motions, 12% mean radial velocities, and 9% having both simultaneously. The authors highlight the need for continued efforts to improve kinematic data, and their group is actively working in this direction.

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