Open clusters in 2MASS photometry - I. Structural and basic astrophysical parameters

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The main goal of our project is to obtain a complete picture of individual open clusters from homogeneous data and then search for correlations between their astrophysical parameters. The near-infrared JHKS photometric data from the 2-Micron All Sky Survey were used to determine new coordinates of the centres, angular sizes and radial density profiles for 849 open clusters in the Milky Way. Additionally, age, reddening, distance, and linear sizes were also derived for 754 of them. For these open clusters our results are in satisfactory agreement with the literature data. The analysed sample contains open clusters with ages in the range from 7 Myr to 10 Gyr. The majority of these clusters are located up to 3 kpc from the Sun, less than 0.4 kpc from the Galactic Plane and 6 - 12 kpc from the Galactic Centre. The majority of clusters have core radii of about 1.5 pc and the limiting radii of the order of 10 pc. We notice that in the near-infrared, open clusters seem to be greater than in optical bands. We notice that a paucity of clusters is observed at Galactic longitudes range from 140{\deg} to 200{\deg} which probably reflects the real spatial distribution of open clusters in the Galaxy. The lack of clusters was also found in earlier studies.

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