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Study of open cluster King 13 using CCD VI, 2MASS and Gaia DR2 Astrometry

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In this paper, we present astrophysical parameters of the open cluster King 13 based on the VI CCD and 2MASS JHK s photometric data. This is a poorly studied cluster, for which new results have been found in the present work. To identify probable members, we use proper motion data from Gaia DR2 catalogue. The mean proper motion of the cluster is determined as − 2.8±0.2 and − 0.88±0.14 mas yr − 1 and cluster extent is derived as 3′.2.
Using color-magnitude diagrams, we estimate the age and distance of the cluster as 510 ± 60 Myr and 3.84 ± 0.15 kpc respectively. Interstellar reddening E (B-V) in the direction of the cluster is determined as 0.80 ± 0.2mag mag using color-color diagram. Mass function slope of the cluster is found to be comparable with the Salpeter value. The total mass of this cluster is derived as 270 M ⊠ . The present analysis shows that King 13 is a dynamically relaxed cluster.

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