

ABSTRACT ONLY

UNSUPERVISED DECONTAMINATION OF
 FIELD STARS IN COLOR-MAGNITUDE
 DIAGRAMS OF STAR CLUSTERS
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Knowledge of the fundamental parameters of star clusters is key to understanding the structure and evolution of galaxies. This is because star clusters are excellent tracers of the different galactic sub-systems. In this work, we present an unsupervised method for decontaminating stars from the field in color-magnitude diagrams (CMD) of star clusters, developed in Python, which allows assigning statistical probabilities of membership to each star observed in the field of a star cluster.

The membership probability of a star to a star cluster is evaluated from the comparison of the properties observed in color-magnitude diagrams of the regions surrounding the cluster of interest and that of the cluster.

The method of cleaning the star clusters’ CMDs consists in the implementation of a Python code that compares the CMDs of areas adjacent to the star cluster with the observed CMD of the cluster of interest. The stars removed from the observed cluster CMD are those closest to the field CMD stars. We perform this process with a thousand different adjacent fields and then estimate the membership probability of each star in the cluster based on survival in the elimination process.

This statistical method was applied to more than 30 star clusters in the Small Magellanic Cloud. This is the first step in order to determine their astrophysical parameters (e.g., age, metallicity and heliocentric distances), with the aim of analyzing their kinematics in the galaxy.

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