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Mapping active stars in open clusters of the Milky Way galaxy - A preliminary study

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Precise mapping of star-forming regions in galaxies is essential to understand the formation of galaxies. Stars that belong to O and B spectral types are considered hot young stars and can be found in active star-forming regions. This study focuses on identifying active star-forming regions in the Milky Way galaxy. A sample of 39 million stars that belong to 3006 open clusters in the Milky Way galaxy was selected for the study. Position, B-R color magnitude, apparent G-band magnitude and parallax angle for each star were selected from GAIA data release II. The surface temperature and spectral class of each star were calculated based on the B-R color-magnitude. The apparent magnitude and the distance for each star were used to calculate the absolute magnitude in G-band. A total of 60982 stars with a surface temperature greater than 10,000 K were filtered. This was confirmed by locating the O and B-type stars in H-R diagrams for a sample of open clusters. The regions where O and B type stars (Stars with surface temperature > 10, 000 K) were located are considered the most active star-forming regions. Position coordinates of each of these stars were converted to the galactic coordinate system and a map with star locations was created.

Keywords: Star formation, Milky Way, HR diagram, Galaxy

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