HISTORY OF THE SOLAR NEIGHBORHOOD STAR FORMATION RATE FROM THE G DWARF METALLICITY DISTRIBUTION

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We present an original method to obtain the local star formation history by using the G dwarf metallicity distribution. The method associates the number of stars ever born in the time interval $(t, t + dt)$ with the number of stars with metallicity between $Z(t)$ and $Z(t + dt)$, where $Z(t)$ is obtained from an empirical age – metallicity relation. The method also incorporates corrections due to the intrinsic cosmic scatter in the interstellar medium. We test the method by simulating the chemical evolution of a galaxy with irregular star formation, and we conclude that our method is appropriate to recover the star formation history from the metallicity distribution of long-lived stars. Preliminary results indicate that our vicinity experienced a starburst era 5 to 8 Gyr ago, followed by a substantial decline in the star formation activity in the last 3 Gyr, a result similar to those found by other authors on the basis of different methods.

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T TAURI STARS FAR FROM MOLECULAR CLOUDS: THE CASE OF AS 216 AND AS 218

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The stars AS 216 and AS 218 show strong Hα emission and they are not embedded in molecular clouds. These facts lead some authors to incorrectly classify them as Be stars. We analyzed low and medium resolution spectra and concluded that they have spectral types K2 and K7, respectively. We confirmed the T Tauri nature of AS 216 and AS 218 because of their location on the H-R diagram and their Li abundance, which we have estimated. The fact that AS 216 and AS 218 are 8° and 10° from the core of the ρ Ophiuchi dark cloud leads us to investigate the hypothesis that these stars have been formed in clouds originally associated to the Complex, but which have since been dissipated. We analyzed the distribution of a sample of T Tauri stars (TTS) in the H-R diagram locus for pre-main sequence stars. We then estimated the masses and ages by confrontation with theoretical evolutionary tracks, assuming that all the TTS (those near or inside the Cloud Complex) lie at the same distance of ρ Ophiuchi. The masses and ages of AS 216 and AS 218 are similar to those of other TTS of the region. We compared the visual absorption and age distribution with angular distances from the cloud complex center. The results have indicated that the isolation of AS 216 and AS 218 could be a projection effect, since others TTS could have been formed in the complex periphery but do not look isolated because they are projected over the clouds.

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VISUAL EXTINCTION MAPS OF SOUTHERN STAR FORMING REGIONS

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We are carrying a program aiming to investigate the visual extinction and mass distribution of southern star forming regions. In this work we estimated the visual extinction of the Ophiuchus molecular cloud complex, obtained from stars counts. The method assumes that in an unobscured field the logarithm of the number of stars brighter than a given magnitude m_λ is a linear function of m_λ. In the direction of a cloud the slope remains the same, but the number of stars decreases as if the stars were counted only to the difference between the magnitude limit and the extinction. Contrary to the traditional method which makes use of photographic plates, the counts are performed on images of the Digitized Sky Survey. We used the Sextractor code by Bertin and Arnouts (1995, in preparation) to obtain a catalog of stars of the regions studied. This process enables the counts in much larger regions than the visual counting performed on plates. A map of the distribution of visual extinction is presented for the Ophiuchus molecular cloud complex, in the range $344° < l < 6.5°$ and $9° < b < 26°$.

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