rapid, stochastic brightness variations from the accretion disk typically are not seen, detectable UV flickering is a common property of symbiotic stars. Supporting our physical interpretation of the two X-ray spectral components, the UV photometry shows that symbiotic stars with harder X-ray emission tend to have stronger UV flickering, which is usually associated with accretion through a disk.

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PHOTOMETRIC ANALYSIS OF GALACTIC STELLAR CLUSTERS IN VVV SURVEY

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We show the preliminary results of the study of the structure of the Horizontal Branch of Liller 1 and some results from the Calcium Triplet method using Ks magnitude applied to several Galactic Globular clusters using data from the VISTA Variables in the Via Lactea Survey (Minniti et al. 2010) and obtained with GeMS/GSAOI. The data are extracted with the new automatic VVV-SkZ_pipeline photometric pipeline (Mauro et al. 2013).

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ATMOSPHERIC STRATIFICATION SIGNS IN NON-LTE OF ^3He AND ^4He IN THE BP STAR A CEN

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We have analyzed a high-resolution and high-S/N UVES spectrum of the Bp star a Centauri (He-variable) by means of state-of-the-art non-LTE spectral synthesis. Atmospheric parameters were determined in an iterative way via ionization equilibria of OI/II and FeII/III and the matching of several Balmer lines simultaneously. Because of chemical stratification and the presence of ^3He, the He lines are not matched with a standard model atmosphere.

A new He model atom accounting for the ^3He isotope and an empirically solution for the He stratification in the line-formation calculations allow us to characterize this star in a more realistic manner than do classical models.

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STELLAR MODELS OF ROTATING, PMS STARS WITH MAGNETIC FIELDS

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We report our ongoing studies of the magnetic field effects on the structure and evolution of low-mass stars, using a method first proposed by Lydon & Sofia (1995, ApJS 101, 357) which treats the magnetic field as a perturbation on the stellar structure equations. The ATON 2.3 stellar evolution code (Ventura et al. 1998, A&A 334, 953) now includes, via this method, the effects of an imposed, parametric magnetic field whose surface strength scales throughout the stellar interior according to one of the three following laws: (a) the ratio between the magnetic and gas energy densities, β_{mg}, is kept at its surface value across the stellar interior, (b) β_{mg} has a shallower decrease in deeper layers, or (c) β_{mg} decays as $[m(r)/M_\star]^{2/3}$. We then computed rotating stellar models, starting at the pre-main sequence phase, of 0.4, 0.6, 0.8 and 1.0 $M_\odot$ with solar chemical composition, mixing-length convection treatment with $\alpha=\Lambda/H_P=1.5$ and surface magnetic field strength of 50 G. Summarizing our main findings: (1) we confirm that the magnetic field inhibits convection and so reduces the convective envelope; (2) the magnetic perturbation effect dominates over that of rotation for 0.8 and 1.0 $M_\odot$ masses, but their relative impact shows a reversal during the Hayashi tracks at lower masses (0.4 and 0.6 $M_\odot$); in any case, the magnetic perturbation makes the tracks cooler; and (3) the magnetic field contributes to higher surface lithium abundances.

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ESTIMATING THE MEAN INCLINATION OF ROTATIONAL AXES OF THE PLEIADES

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Stellar rotation has its origin in stellar formation, when the angular momentum of the parent cloud is transferred to the newer stars. The equatorial rotation V can be calculated from the radius and rotation periods by $V = 2\pi R/P$. The mean $\langle \sin i \rangle$, since i is the inclination angle between the stellar rotation axe and the line of sight, of a sample of observational data is estimated from the ratio between the mean of the projected velocity $\langle V \sin i \rangle$ and the mean of the equatorial rotation $\langle V \rangle$. In the literature, the mean inclination angle always adopts a value of $\pi/4$ independent of the particularities of the stellar population or the data sample under study. Such a procedure not infrequently leads to divergences between theoretical models and observed data. The present work intends to find out the real mean inclination angle for a set of stars in Pleiades cluster.

This work fits the distribution function of the true rotation of a sample of Pleiades stars with the generalized distribution function, named q-Maxwellian function. Also we determine the q value by fitting the projected rotational velocity distribution of those stars. Finally the q values obtained from the fitting procedures are used to estimate the mean $\langle \sin i \rangle$ for such Pleiades sample producing a good result when compared to mean values from the observational data.

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ON THE LOCAL DARK MATTER DENSITY

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Moni Bidin et al. (2012, ApJ, 751, 30, hereafter MB12) has recently proposed a new formulation to calculate the dynamical mass density enclosed in a large volume of the Galaxy, by means of the three-dimensional kinematics of a test stellar population. Applying this formulation to three kinematical data sets available in the literature, they surprisingly found a lack of dark matter at the Solar position. Bovy & Tremaine (2012, ApJ, 756, 89, hereafter BT12) argued that MB12 calculation is flawed by a wrong assumption, and that a corrected one-dimensional formulation recovers the expected amount of dark matter. In this contribution, we show that BT12 formulation is based on an assumption ruled out by all observational evidence, that causes a strong overestimate of the mass density. Moreover, we show that the MB12 assumption criticized by BT12 has negligible effects on the results, hence their criticisms is not the solution to the puzzling results found by MB12.

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SUPERNOVA REMNANTS COLLIDING WITH MOLECULAR CLOUDS: FROM HIGH- TO LOW-ENERGY INTERACTIONS

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It is now well established that a class of gamma-ray sources in the galactic plane, especially in the TeV range as seen by HESS and other Cerenkov telescopes, and in the GeV range by the Fermi and AGILE satellites, is associated with intermediate-age supernova remnants interacting with molecular clouds in massive star-forming regions. After a brief general introduction linking high-energy gamma-rays and cosmic rays, I will focus on a few such gamma-ray sources (W28, W44, and W51) and the challenging conclusions that can be drawn from them. I will then describe our recent work on related submm measurements and implications of enhanced ionizing effects in molecular clouds due to locally accelerated low-energy cosmic rays.

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