XIV Latin American Regional IAU Meeting (Florianópolis/SC, Brazil, 25-30 November 2013)
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AM CVn stars are ultracompact binaries ($P_{orb} <$ 65 min) where a hydrogen-deficient low-mass, degenerate donor star overfills its Roche lobe and transfers matter to a companion white dwarf via an accretion disc. SDSS J0926+36 is currently the only eclipsing AM CVn star and also the shortest period eclipsing binary known. Its light curve displays deep ($\sim$ 2 mag) eclipses every 28.3 min, which last for $\sim$ 2 min, as well as $\sim$ 2 mag amplitude outbursts every $\sim 100 - 200$ d. Superhumps were seen in its quiescent light curve in some occasions, probably as a reminiscence of a (in some cases undetected) previous outburst. Its eclipsing nature allows a unique opportunity to disentangle the emission from several different light sources, and to map the surface brightness distribution of its hydrogen-deficient accretion disc with the aid of maximum entropy eclipse mapping techniques. Here we report the eclipse mapping analysis of optical light curves of SDSS J0926+36, collected with the 2.4 m Liverpool Robotic Telescope, covering 20 orbits of the binary over 5 nights of observations between 2012 February and March. The object was in quiescence at all runs. Our data show no evidence of superhumps nor of orbital modulation due to anisotropic emission from a bright spot at disc rim. Accordingly, the average out-of-eclipse flux level is consistent with that of the superhump-subtracted previous light curves. We combined all runs to obtain an orbital light curve of improved S/N. The corresponding eclipse map shows a compact source at disc centre ($T_b \simeq 17000\,K$), a faint, cool accretion disc ($\sim 4000\,K$) plus enhanced emission along the gas stream ($\sim 6000\,K$) beyond the impact point at the outer disc rim, suggesting the occurrence of gas stream overflow at that epoch.

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ALS 2883: ANALYSIS OF SPECTROSCOPIC FEATURES

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ALS 2883 (RA $13^h02^m47^s$, DEC $-63^o50'08''$, M_v 10.1) is the first known radio pulsar with an emission B-type companion system, discovered in 1992. The Be companion of ALS 2883 has all line profiles in the visible range in emission. This emission is a common hallmark among many Be stars, and this effect is thought to be due to the presence of a circumstellar environment. Also, the star is orbiting a X-ray source as has been detected by the XMM-Newton Science Operation Center. In this study, we present the observations of ALS 2883 made at the OPD/LNA 1.60 m telescope with the Coudé spectrograph in the range 4000 to 5000 Å and S/N $\simeq$ 200, performed in April 2011. First-order estimations of T_{eff} and log g parameters have been performed through Johnson's UBV and JHK photometric calibrations. Projected rotation velocity V sin i has been estimated through the mean of the first zeroes of the Fourier transforms of neutral helium rotation profiles adopting linear, quadratic and square-root limb-darkening laws. The physical conditions of the circumstellar envelope were estimated through the solution of the radiative transport equation assuming local thermodynamic equilibrium within a disk-shaped circumstellar environment with a Keplerian velocity field. The radiative transport equation is solved assuming the Roche model as a boundary condition in the circumstellar environment. Iterating the computations with a downhill-simplex algorithm, this analysis leads to a best solution for an envelope with T $\simeq$ 9500 K, gas density $\rho \simeq 2 \times 10^{-15} g.cm^{-3}$, internal radius $r_i \simeq 8\ R_\odot$ and external radius $r_e \simeq 30\ R_\odot$, rotating with $V_{rot} \simeq 140$ km.s^{-1} and expanding with $V_{exp} \simeq 90$ km.s^{-1}.

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TIME-DEPENDENT NONEXTENSIVITY ARISING FROM THE STELLAR ROTATION

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In nonextensive formalism (NF) the index q can be interpreted as a parameter of long-memory. When $q \to 1$ the system becomes extensive and the memory effects are negligible. We found that for solar-type stars in open clusters the index q of the distribution of $V \sin i$ decreases with the cluster age. The extensivity of the distributions ($q = 1$) is not present until about an age range of $100 - 700$Myr. A possible explanation for the anti-correlation can be the

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memory of the initial stellar angular momentum vanishing, considering q as a memory parameter ($q = 1$ corresponding to no memory). In fact, these stars retain the memory of their initial angular momentum until an age > 100 Myr (e.g., Bouvier et al. 1997, A&A, 326, 1023). de Freitas & De Medeiros (2013, MNRAS, 433, 1789) shown that the rotation-age relationship can be reproduced using a model from NF. In this model the index q_K is derived from the Kawalers parameterization, where $q_K = 1$ indicates the saturated magnetic field regime, and the unsaturated one is given by $q_K = 1 + 4aN/3$. The parameters a and N are related to the dynamo and magnetic field geometry, respectively. We used the de Freitas & De Medeiros' model to derive an empirical relationship between q, a and N as the equation $q \approx q_0(1 - \Delta t/q_K)$, where $\Delta t = t - t_0$ is the age range, and q_0 is the index$q$ for the cluster with age t_0. This equation constitutes a bridge between q and the theory of magnetic braking of stellar rotation.

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ZINC ABUNDANCES IN GALACTIC BULGE STARS

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Zinc is overabundant in metal-poor stars (Cayrel et al. 2004), being partially produced by neutron addition. It decreases with increasing metallicity, similarly to alpha-elements. In order to trace its abundance, the derivation of Zn abundance in different stellar populations, and varying metallicities, helps understanding its nucleosynthesis processes.

Zn is also the main element of reference to derive the metallicity from absorption lines in quasars (QSOs), which allows to compare their evolution as a function of redshift and metallicity in metal-poor stars.

In the present work, we derive Zn abundances for a sample of 56 bulge field stars, observed at high resolution with the FLAMES-UVES spectrograph. The mean wavelength coverage is 4800-6800 Å, at a resolution R $\sim$ 45000. The atmospheric parameters effective temperature, gravity and metallicity were derived in Zoccali et al. (2008) and Hill et al. (2011). Recently we have analysed the manganese abundances of this sample (Barbuy et al. 2013).

To compute the Zn abundances we use spectrum synthesis, for the lines ZnI 4810.53 and 6362.34 Å. The analysis of our data shows that the abundance of [Zn/Fe] decreases with increasing metallicity, in agreement with the data obtained from the literature. The details of Zn behaviour for the metal-rich bulge stars of the present work are under analysis.

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A STUDY OF ROTATIONAL VELOCITY DISTRIBUTION OF BE STARS

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Classical Be stars are rapid rotators of spectral type late O to early A and luminosity class V-III, which exhibit Balmer emission lines and often a near infrared excess originating in an equatorially concentrated circumstellar envelope, both produced by sporadic mass ejection episodes. The causes of the abnormal mass loss (the so-called Be phenomenon) are as yet unknown. In spite of their high $v \sin i$, rapid rotation alone cannot explain the ejection episodes as most Be stars do not rotate at their critical rotation rates. In this work we present the distribution of $v \sin i$ of 261 Be's stars from BeSS (Be Star Spectra) database. We used two techniques, the Fourier method and the FWHM (Full Width at Half Maximum) method. For the analysis we made use of three absorption lines of Helium (4026Å, 4388Å and 4471Å). Stars with projected rotational velocities up to 300 kms^{-1} agree with the ones already published in the literature. 84 of our stars do not have the values of rotational velocity published. The majority of our sample are B1/B2 spectral type, whose have the greatest velocities.

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MORE FITTING $V \sin I$ DISTRIBUTION FOR EVOLVED FIELD STARS

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We use 1536 $V \sin i$ measurements of evolved field stars in order to determine the q parameter from