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the named q-Maxwellian model (Soares *et al.* 2006, Physica A, 364, 413), a power-law type distribution function that adjusts the distribution of the projected rotational velocity. Then we compare the different distributions of $V \sin i$ obtained for different $B-V$ intervals with the distribution model using the Kolmogorov-Smirnov statistical test to find the best fit.

Results revealed that, as overall trend, low $B-V$ tends to exhibit $q > 1$ values while $q < 1$ for high $B-V$ for all classes of stars under study. Specifically, this point indicates rotation distributions with long tails due to the percentage of stars with relatively high speed for low $B-V$, and tailless distributions for stars of high $B-V$. Furthermore, it is a general behavior that binaries present q values slightly higher than singles indicating that their rotation distributions are wider than the single ones. As another broad trend, binaries tend to have $q < 1$ values later than their fellow-colors. In addition, there exists an inversion point in $B-V$, from which $q > 1$ regime switches to $q < 1$ regime, that is higher the more evolved is the luminosity class.

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SN 2009N: ANOTHER SUPERNOVA BETWEEN THE NORMAL AND SUBLUMINOUS TYPE II-P SNE

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We collected ultraviolet, optical, and near-infrared photometry together with optical and near-infrared spectra of SN 2009N. The optical spectra had narrow features with low velocities, typical of subluminous SNe II-P. The bolometric luminosity during the plateau phase was in between those of the subluminous and normal SNe II-P.

The NIR spectra of SN 2009N contain features typical of SNe II-P, with the exception of the appearance of a feature at $\sim 1.055\,\mu$m +48 days after the explosion. Via spectral modeling we found that this line is probably due to high-velocity He I λ10830 The presence of this line, together with a HV component of Hα, can be an indicator of weak interaction of the ejecta with circumstellar material.

We estimated the distance to SN 2009N using multiple versions of both the expanding photosphere method and the standardized candle method as $D = 21.6 \pm 1.1$ Mpc ($\mu = 31.67 \pm 0.11$). The produced nickel mass was estimated to be 0.020 ± 0.004 M$_\odot$. We determined the physical properties of the progenitor at the explosion via hydrodynamical modeling. The total explosion energy ($\sim$ 0.48 foe) is in between the values typical of subluminous and normal SNe II-P. The pre-supernova mass ($\sim 13 - 13.5\,$M$_\odot$) is consistent with that of red supergiant stars, while the relatively small estimated radius at the time of the explosion ($R_{\rm ini} \approx 287\,R_\odot$) can point to a yellow supergiant star.

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REVISITING TW HYDRAE IN LIGHT OF NEW ASTROMETRIC DATA

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Our efforts in the present work focused mainly on refining and improving the previous description and understanding of the stellar association TW Hydrae (TWA) including a very detailed membership analysis and its dynamical and evolutionary age.To achieve our objectives in a fully reliable way we take advantage of our own astrometric measurements (Ducourant et al. 2013) performed with NTT/EFOSC2 - ESO (La Silla - Chile) spread over three years (2007 - 2010) and of those published in the literature.A very detailed membership analysis based on the convergent point strategy as developed by our team (Galli et al. 2012, 2013) allowed us to define a consistent kinematic group containing 31 stars among the 44 proposed as TWA member in the literature. Assuming that our sample of stars may be contaminated by non-members and to get rid of the particular influence of each star we applied a Jacknife resampling technique generating 2000 random lists of 13 stars taken from our 16 stars and calculated for each the epoch of convergence when the radius is minimum. The mean of the epochs obtained and the dispersion about the mean give a dynamical age of 7.5 ± 0.7 Myr for the association that is in good agreement with the previous traceback age (De La Reza et al. 2006). We also estimated age for TWA moving group members from pre-main sequence evolutionary models (Siess et al. 2000) and find a mean age of 7.4 ± 1.2 Myr. These results

show that the dynamical age of the association obtained via the traceback technique and the average age derived from theoretical evolutionary models are in good agreement.

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DIFFERENTIAL CHEMICAL ABUNDANCES OF HEAVY ELEMENTS IN SOLAR TWINS

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In this work we present differential chemical abundances of neutron-capture elements (Z >30) in solar twins. We have obtained high resolution (R = 60,000) and high S/N (>100) spectra of solar twins in the ultraviolet region (310-400nm) with the UVES spectrograph at the VLT/ESO. In the same configuration we also observed that the Sun, that is our reference for the differential analysis, thus obtaining results with high accuracy and precision. In the ultraviolet there is a large number of atomic transitions of heavy elements, which allows the detailed study of the r and s processes. Our sample of solar twins covers a wide range of ages, so it will be possible to study the temporal evolution of the neutron capture elements.

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ON THE SENSITIVITY OF EXTRASOLAR MASS-LOSS RATE RANGES: HD 209458B A CASE STUDY

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We present a 3D hydrodynamic study of the effect that different stellar wind conditions and planetary wind structures have on the calculated Lyα absorptions during the transit of HD209458b. We approach the problem using 3D hydrodynamic simulations. Considering a range of stellar wind speeds $\sim[350-800]$ km s^{-1}, coronal temperature $\sim [3-7]\times10^6$ K and two values of the polytropic index $\Gamma \sim [1.01-1.13]$, while keeping fixed the stellar mass loss rate, we found a that a $\dot{M}_p$ range between $\sim [3-5]\times10^{10}$g s^{-1} give account for the observational absorption in Lyα measured for the planetary system. Also, several models with anisotropic evaporation profiles for the planetary escaping atmosphere were carried out, showing that both, the escape through polar regions, resembling the emission associated with reconnection processes, and through the night side, produced by a strong stellar wind that compresses the planetary atmosphere and inhibits its escape from the day hemisphere yields larger absorptions than an isotropic planetary wind.

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INFRARED ACCRETION DISC MAPPING OF THE DWARF NOVA V2051 OPHIUCHI IN OUTBURST AND IN QUIESCENCE

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Dwarf novae are compact binaries where a late-type star (the secondary) fills its Roche lobe and transfers matter to a companion white dwarf (the primary) via an accretion disc. They show outbursts which recur on timescales of weeks to years, where the accretion disc brightens by factors 20 to 100 either due to a thermal-viscous instability in the disc (DI model) or to a burst of enhanced mass-transfer from the secondary (MTI model). We report time-series of fast photometry of the dwarf nova V2051 Oph in the J and H bands, obtained with the CAMIV at the 1.6 m telescope of Observatório Pico dos Dias/Brazil, during the decline of an outburst in 2005 June, and in 2008 when the object was in quiescence. We modeled the ellipsoidal variations caused by the secondary to infer its contribution to the J and H fluxes, and fitted stellar atmosphere models to find a photometric parallatic distance of $d = (111 \pm 14)pc$. Front-back brightness asymmetries in J and H-band eclipse maps along the decline from the 2005 outburst suggest that the accretion disc had a non-negligible opening angle which decreased as the disc cooled down. The time evolution of the disc radial temperature distribution along the outburst decline shows a cooling wave which *accelerates* as is travels inwards – in contradiction to a basic prediction from the DI model.