ESTADO ACTUAL DE LA FOTOMETRIA SUPERFICIAL DE GALAXIAS EN CORDOBA

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Se brinda un informe de las posibilidades actuales en materia de Fotometría Superficial de Galaxias en Córdoba, tanto en materia de hardware como de software, analizando asi mismo la confiabilidad del sistema. Se presentan también los trabajos realizados en el tema y los proyectos futuros.

STATISTICAL PROPERTIES OF CDM GALACTIC HALOS

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We analyze cosmological N-body simulations of comoving regions of 4-6 Mpc/h radius in a standard biased cold dark matter (CDM) cosmology. We study intrinsic statistical properties of protogalactic halos and those related to the nearby distribution of neighbors. We have considered the dependence of the statistical results on the dimensionless spin parameter ℓ, velocity anisotropy, axial ratios and masses. The statistics shows that the major axis of a galactic halo is preferentially oriented with the directions to the nearby neighbors. We find also that the spin of an object tends to be perpendicular to the direction to the nearest neighbor. This signal is strongly suppressed when all neighbors other than the closest are considered. Although intrinsic properties of the halos are correlated with ℓ, we find no relevant differences in the statistical behavior of spin orientations with respect to the distribution of neighbors.

We discuss the possibility that galaxy properties were transfered from their host halos and we analyze observational correlations expected in this standard model.

COUNTS, COLORS AND CLUSTERING OF MEDIUM REDSHIFT GALAXIES

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As part of a study of large scale structure at intermediate redshifts, a catalog of faint galaxies has been derived for a 2.2 deg^2 area (maximum angular extent $\sim 2{.}^{\circ}5 \times 2{.}^{\circ}5$) near the North Galactic Pole. Observations were carried out at the CFHT in Mauna-Kea, Hawaii. The data comprising the catalog are found to be complete to limiting magnitudes $J \simeq 24$ and $F \simeq 23$.

Galaxy counts and color distributions have been obtained from the catalog. A logarithmic slope of d (log N)/dm = 0.45 was derived for J over $20 \leq J \leq 24$, and d(log N)/dm = 0.37 for F over $19 \leq F \leq 23$. The galaxy counts in this catalog match almost perfectly onto counts over the range $15 \leq J \leq 20$ from the APM survey (Maddox et al. 1990, MNRAS, 247, 1P), and onto the faint CCD counts by Tyson (1988, AJ, 96, 1) at $J \geq 23$. These three data sets therefore provide a well-defined mean relation for galaxy counts in the J bandpass. No significant variations are seen in the mean number density of galaxies over our fields. It is shown that this constraint requires that the extent of large scale inhomogeneities ("sheets") in the galaxy distribution across the line of sight must be larger than about 25 h_{100}^{-1} Mpc – in reasonable accord with observations of large scale structure in the CFA survey. There is a dramatic change in the slope of the J and F counts fainter than $J \approx 22.5$ and $F \approx 21.5$. This implies a change in the properties (number count slope or mean color) of fainter galaxies relative to those at $J \leq 22$, and cannot be due solely to the presence of a new population of faint blue objects.

The 2-point angular correlation function of galaxies on scales $\leq 1^{\circ}$ down to $J \approx 24$ and $F \approx 23$ was derived. The most important results are as follows: (i) The slope $dlog(\omega)/dlog\theta$ decreases about 15% towards fainter limiting magnitudes. (ii) The amplitude A, after fitting $\omega(\theta) = A\theta^{-0.8}$ to the data, increases towards brighter limiting magnitudes. (iii) The power law behaviour of $\omega(\theta)$ breaks at angles which decrease with limiting magnitude. These results are consistent with a picture where there is evolution of clustering (galaxies were less clustered in the past), and with the existence of a characteristic scale size in the Universe.

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A NEW ABUNDANCE CALIBRATION FOR THE WASHINGTON SYSTEM AND SOME EARLY RESULTS

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A revised metal-abundance calibration for the Washington photometric system is presented which represents a significant improvement over previous

calibrations in several respects. First, new observations of a number of field and open cluster giants allow a much more precise definition of the solar-abundance fiducial relation in the 2-color diagrams from which the abundance-sensitive delta indices are derived. Secondly, observations of a large sample of globular cluster giants clearly demonstrate, and allow correction for, a decrease in metallicity sensitivity for cooler giants. Thirdly, a new abundance index, C-T1, and a new temperature index, M-T2, are introduced. The M-T2 color provides a much broader baseline than the T1-T2 color and is thus much less susceptible to photometric errors in determining abundances.

Metal-abundance calibrations are derived over the range from [Fe/H] = +0.5 to −4, with an error of 0.15 dex. The abundance indices vary by 1 mag. over this range. We confirm that the Washington system offers a unique combination of efficiency and accuracy for determining metallicity in late-type giants over the full range of stellar abundances, although the system loses sensitivity for the coolest metal-poor stars. The Washington abundance scale for globular clusters is in good agreement with that of Zinn, and with that of Janes for open clusters.

The system and new calibration are then used to investigate abundances of some of the most metal-poor globular clusters in the Galaxy. Several clusters, including NGC 2298, NGC 4590 and NGC 6101, are found to be significantly more metal-poor than previously thought, approaching [Fe/H] −3 and thus extending the lower limit to globular cluster metallicities by 0.5 dex. This has profound effects on the ages of these objects, the Universe, and everything.

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ATMOSPHERIC OSCILLATION IN BETA MON A

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We analized a series of 42 plates obtained with the 1.5m reflector at CTIO. It appears that Beta Mon A suffers 1.7 hours atmospheric oscillations that vary in amplitude from one cycle to the next. The observed profile of Mg II λ 4481 is variable and, sometimes, displays emissions.

Be STARS: SOLUTIONS OF THE MASS, MOMENTUM, AND ENERGY EQUATIONS OF THE RADIATIVE TRANSFER PROBLEM

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We have computed theoretical profiles of Hα on the basis of an expanding chromospheric structure, solving the radiative transfer problem in spherical geometry and the statistical equilibrium. The profiles obtained are of the type of the ones observed in Be stars. The temperature and velocity laws introduced to solve the transfer equation can be obtained by solving the mass, momentum and energy equation; it has to be taken into account that the characteristic length of dissipative phenomena is different in the regions of minimum and maximum temperature.

We also computed an atmospheric model for the continuum, including velocity gradients, in order to predict the IR excess and its relation with the Hα profile.

RADIAL VELOCITY RESEARCH USING THE FACILITIES OF SOME OBSERVATORIES AT THE SOUTHERN ANDES

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We review some of the current research that we are doing using observations from CTIO and CASLEO suitable for radial velocity measurements. The programs are devoted to the study of the frequency of binaries among open clusters and associations, and among groups of peculiar objects like, He weak, H_e rich and Ae stars among others. Also we will comment about a contribution to the study of the space velocities of Ap stars that will be observed by Hipparcos. We will provide the radial velocity component for these stars. Some results will be shown as well as instrumentation for radial velocity work available at CA.

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