ABSTRACTS

30.10.05 Recent Studies of the Chromospheres and Crowns of K-Type Stars and the Local Interstellar Medium using the Copernicus Satellite. J. L. Linsky, JILA (U. of Colo. and NBS), W. Mcintosh, R. C. Henry, and R. W. Noo, Johns Hopkins, and C. S. Bassi, JILA. — We report on recent observations of K-type stars using the Princeton experiment on Copernicus. The K0 III star η Gem has now been observed four times at the location of the O V λ1218, O VI λ1032, and Si III λ1206 lines. The active chromospheric star α Gem (K1 III) has been observed in the same lines to search for a transition region or corona. We have obtained high quality V2 observations of the Mg II lines in a Tau (K5 III) which indicate a stellar wind like a Boo, and VI observations of the Mg II λ line in ζ Eri which give an accurate line width. We also describe recent results of our program to determine the density and flow velocity of the local (<10 pc) interstellar medium and deuterium abundance.

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THURSDAY, 24 JUNE

Session 31: Roberts Hall, 0830-1200

Invited

Interacting Galaxies. A. Toomre, M.I.T.

31.01.10 The Galaxy Distribution in Abell Clusters. M. Scudder and P.J.E. Peebles, PRINC. U. — The cross correlation of Abell clusters with the Shane-Wirtanen Galaxy Catalogue yields the mean angular distribution of galaxies around a cluster, n(θ), as a function of distance. Both the general structure of n(θ) and much of the detail can be adequately reproduced by the following model. At each Abell position, place a simple cluster with density ρ = A_d/θ^2, 0 < d < d', where d stands for Abell's distance class. The exponent τ and the cutoff radius are the same for all clusters. The cutoff angle θ_d is scaled down with distance and the coefficients A_d are chosen to fit the data. Computation of the mean spatial density run in a cluster provides a reasonable test of the galaxy luminosity function. This work was supported in part by the National Science Foundation.

31.02.10 A Non-Dynamical Hierarchical Model of Galaxy Clustering. R.M. Sundin and P.J.E. Peebles, PRINC. U. — We construct model catalogues of galaxies designed to match the spatial clustering hierarchy picture suggested by the two- and three-point galaxy correlation functions (Eplee and Groth 1975, Ap. J., 196, 1). These indicate that the matter distribution observed with resolution r (r < 10 h^2 Mpc, H = 100 km s^-1 Mpc^-1) appears clumpy with the clump size ~ r and typical density within clumps ~ ρ/(1 + r^2) with γ = 1.77 and ν = the mean density of galaxies. This is reproduced as follows: define a cluster center by placing a sphere of radius r_c at random in space. Place n spheres of radius r_c/λ at random with centers within the sphere (where n is drawn from a distribution P_r with mean μ_r, λ = μ_r^{1/3} - 1), and r_c = 22 h^{-1} Mpc). For each of these spheres draw a new θ and place at random θ spheres of radius r_c/l^2 with centers within the sphere. This process is repeated down the hierarchical chain through r_c clustering levels such that for the final level (which corresponds to galaxies) there are ~ n^2 points within a distance r_c = r_c/λ - 1, l = 1, 2, ... of a given point. The distribution P_r determines the relative amplitudes of all orders of the correlation functions. Each galaxy is assigned an absolute magnitude drawn from a luminosity distribution. This process is then repeated each time starting from a new cluster center, until the desired number of galaxies brighter than the limiting magnitude is obtained. We compare the maps of galaxy angular positions as well as the angular two and three-point correlation functions and the nearest-neighbor distributions (which depend on all orders of correlation functions in several model catalogues with real data from the Zwicky catalogue (σ_1 = 25) and the Shane-Wirtanen catalogue (σ_1 = 19). The research supported in part by the National Science Foundation.

31.03.10 A Microwave Search for Hot Gas in Clusters of Galaxies. GEORGE LAKE, PRINCETON UNIVERSITY & R. N. PARTRIDGE, Haverford College. — The antenna temperature of the cosmic microwave background radiation will be lowered by inverse Compton scattering as the radiation passes through hot intergalactic plasma in clusters of galaxies. We have searched for this effect at λ = 9mm in 7 clusters known to be X-ray sources. Our results set upper limits on the temperature and/or the total mass of HII in the clusters.

31.04.10 Radio Sources in Zwicky Clusters. J. O. BURNS (INDIANA) & F. N. OWEN (HARW) —