off render the big-bang origin of the cmb questionable, and rob the big-bang cosmologies of their most convincing support. In the closed space of the ffb model, with the metric of an Einstein static universe of projective geometry, ghost images of a galaxy appear centered at the galaxy. Through scattering of the photons of the thermal radiation of the galaxy during round trips, the ghost images have an order of magnitude larger extension than the galaxy and are redshifted by $\exp(n\pi)$. The 2.7K cmb arises from the third ghost image of the galaxy. J.M. Barrow and M.P. Barrow in External Galaxies and Quasi-Stellar Objects, ed. D. J. Evans, IAU Sym. 34, (1972). Ghost images having no velocity or rotation relative to their original source, the galaxy, no anisotropy has to be expected. The density of cmb being high only in the immediate vicinity of the galaxy, no cut off in the cosmic ray spectrum should occur either. While the big-bang explanation of the cmb is in contradition with observations, the cmb explanation is not.

08.09.10 Redshift Patterns in Coma Cluster Emission Line and Radio Galaxies. W.G. Tifft, Univ. Ariz. - Based upon a complete sample of Zwicky catalog galaxies within 3' of the center of the Coma cluster, emission line galaxies in the cluster are shown to fall in three distinct areas of the redshift magnitude diagram. Radio galaxies, including non-emission objects, occupy two of the same regions. Emission line strength and ratios are generally similar within each group but differ between groups. Group membership correlates with radial location but there is symmetry in distribution (i.e. no clumping suggestive of "cloud" motions). The three groups correspond closely with the three primary redshift-magnitude bands although these galaxies played no significant part in the original definition or location of the bands. A dynamical explanation of the pattern requires an extraordinary asymmetrical velocity field coupled with spatial symmetry and Earth oriented orientation. No steady state can be imagined. The dynamical dilemma plus the close correspondence with the inner redshift-magnitude band pattern supports an alternative non-Doppler interpretation of the redshift.

08.10.10 Extending the Angular Size-Flux Density Relation. K.C. Jacob, U.VA., N.J. Haas & K. Hanol, U.Groningen. - We found 190 radio sources, 45 of them extended, on Westerbork synthesis maps at 1.4 GHz. The integrated flux densities ranged from 5 to 2000 m.f.u., and the sample is complete to 30 m.f.u. The data were binned in flux density, and statistical angular sizes determined. Observational and selection effects were carefully analyzed. Combining these data with those from four other similar surveys, we have constructed the angular size-flux density relation for extended radio sources from 40 f.u. to 16 m.f.u. Our results indicate a strong source-luminosity, cosmic evolution (the Universe is not Euclidean), and point toward a Friedman cosmological model with $q_0 < 1$. In addition, a strange effect was discovered for which we still have no explanation: As a function of flux density, the normalized angular sizes are a mirror image of the differential number counts! It appears that the strong sources are deficient in number and over-large angular size. K.C.J. acknowledges a Sesquicentennial Associateship from the U.Va., and the generous hospitality of the Kapteyn Astronomical Institute during 1975.

TUESDAY, 22 JUNE

Session 9: Stokes Hall, 1400-1730

09.01.03 On the Origin of $2^h 40^m$ Global Solar Oscillations. S. P. WORDEN, Sacramento Peak Observatory, AFGL, Sunspot, NM 88349 - Several observations of global solar oscillations determined from velocity measurements have been recently reported. With a period of $2^h 40^m$ and an amplitude of several m/sec these results have rather exotic consequences. If interpreted as a fundamental mode oscillation a period of $2^h 40^m$ would imply a highly homogenous solar interior structure. Such an interior structure is totally inconsistent with current understanding of solar energy generation mechanisms. It is to be noted however, that the solar surface is covered with large scale presumably convective motions (Supergranulation). With sizes of some tens of thousands of km and line of sight velocity amplitudes of 100-500 m/sec, these cells would be expected to produce an instantaneous velocity signal averaged over the entire sun of several m/sec. Moreover, their sizes are such that solar rotation would move them into and out of an instrumental field of view in several hours. We must therefore consider the possibility that the apparent $2^h 40^m$ oscillations are caused by the rotation of supergranules through the instrumental field of view. Full disk high resolution ($2^\prime$) velocity observations obtained on the Sacramento Peak Diode Array Magnetograph have been studied to determine if this mechanism can produce a period of $2^h 40^m$. Based on these data it is concluded that this phenomenon may well be responsible for these oscillations.

09.02.03 Observations of the Solar Velocity Field for $K_{y} (T) = (255, 250, 235)$, W.J. BROOKS, Jr., UCLA and JPL, R.K. ULBRICH, UCLA, and G.W. SIMION, SACRAMENTO PEAK OBS.- Time series of digital images of the solar velocity field in the photospheric Fe I line at $\lambda 5576$ have been obtained with the diode array of the Sacramento Peak Observatory Tower Telescope.

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