QSO REDSHIFT LIMIT AND PERIODICITY IN A FIB UNIVERSE

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The FIB cosmology was conceived half a century ago, to explain the origin and spectrum of the ultrahigh energy cosmic ray particles we observed in deep mines. It succeeded in explaining quantitatively the 3°K microwave background radiation (IAU Symposium No. 44), the redshift periodicity (PASP 1976), and the cutoff of QSO's beyond z=3.5 (AAS 1982).

The FIB universe corresponds to the $\dot{R}=\ddot{R}=0$ solution of the Friedman equations, with radiant energy in the form of neutrinos dominating over matter. The perfect cosmological principle is valid. Length, time and energy quantities of signal carriers increase relative to the same quantities of elementary particles. The perfect cosmological principle demands that all three quantities change according to the same exponential function of travel time: $\omega/2H_o$. The spin of photons and neutrinos changes as $s=s_o e^{\omega}$; hence, $\omega=2\ln(1+z)$.

When the photon spin approaches 1.5, it decays into a photon of spin 1 and a neutrino, the latter carrying $1/3^d$ of the energy of the decaying photon. The ensuing periodic drop in apparent brightness of QSO's causes the periodicity in their ln(1+z) histogram. The power spectrum of the histogram of seven complete samples of 440 QSO's displays this periodicity at a peak power of 29. The energy within a photon beam decreases as 1+z. The apparent magnitude of an object of M absolute magnitude is $m=5 \log 1/2 \sin 2\ln(1+z)+43+M+2.5 \log(1+z)$. This function implies that at high redshifts the slope of the Hubble plot of QSO's should reverse its sign, as this is indeed seen in four independent samples.

The histogram of lensed Seyfert galaxy nuclei (A.J. 1965) is $n=(\omega-1/2\sin 2\omega)\sin^2\omega\Delta\omega$; n becomes zero at the antipode, simulating a cutoff around z=3.81. The histogram matches that of the Osmer-Smith sample. Objects could be visible from two opposite directions.

Neutrinos which after several round trips have reached energies in excess of 10^9 eV and arrive focused upon their parent galaxy, supply, in the form of their relativistic mass, the invisible mass of galactic halos, the "missing mass." Transformation of radiant energy into rest mass, and vice versa, regulates R_o and insures the stability of the Einstein static universe.

For further details, see the 14 pages of "notes" distributed at the Symposium. Copies will be supplied upon request.

G. O. Abell and G. Chincarini (eds.), Early Evolution of the Universe and Its Present Structure, 55.