THE LARGE SCALE STRUCTURE OF THE X-RAY UNIVERSE

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The clustering of the background-contributing X-ray sources is reflected in the excess (i.e., non-Poisson) fluctuations in the X-ray background (XRB). Observational limits on $\Delta I/I$ can therefore be used to constrain either the clumpiness of X-ray sources or their contribution to the XRB if their clustering properties are known (see Barcons & Fabian 1987 for details).

At present, the most stringent limit on $\Delta I/I$ is $\sim$ 2.3 % on scales of 5^{o} (Shafer & Fabian 1983). If QSOs cluster on scales $\sim 10\ h^{-1}$ Mpc (Shanks et al. 1986), and follow roughly the redshift distribution given in the ASIAGO catalog for X-ray QSOs, then they cannot contribute more than 10 - 30 % of the observed background. If, on the other hand, most of the XRB is produced by a hot intergalactic medium (IGM), its maximum clumpiness scale should be $< 7\ h^{-1}$ Mpc. The fluctuations that a clumpy IGM imprints in the microwave background (through Sunyaev-Zeldovich effect) depend on the clustering model. For the Guilbert & Fabian (1986) two-phase IGM model (which reproduces the spectrum of the XRB with $\Omega_{baryon} \simeq 0.1$), the size of the high density clumps has to be less than a few tens of kpc to keep $\Delta T/T$ below the subarcminute observational upper limits.

More information about the structure of the X-ray Universe will emerge when observational data on the XRB on scales $\sim$ 1 arcmin (from AXAF, BBXRT & XMM) become available.

Barcons, X. & Fabian, A.C., 1987. Submitted to M.N.R.A.S.
Guilbert, P.W. & Fabian, A.C., 1986. M.N.R.A.S., 220, 439
Shanks, T., Fong, R., Boyle, B.J. & Peterson, B.A., 1986. Preprint
Shafer, R.A. & Fabian, A.C., 1983. in IAU Symposium No. 104: Early Evolution of the Universe and its present structure. Ed. G.O. Abell & G. Chincarini. Dordrecht:Reidel.

J. Audouze et al. (eds.), Large Scale Structures of the Universe, 539.
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https://doi.org/10.1017/S007418090013668X Published online by Cambridge University Press