Resolving the X-ray Spectral Paradox: XMM-Newton Spectra of Faint Sources in the Lockman Hole and Groth-Westphal Strip

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Abstract

Using 100ks of XMM-Newton data on the Lockman Hole, and a similar dataset on the Groth-Westphal HST-Survey area, we show how the X-ray background 'spectral paradox' is being resolved. We find the summed spectra of the Type I AGN, Type II AGN, and the unidentified objects. We conclude that the hard slope of the XRB is caused predominantly by latter sources, i.e. the Type II AGN and unidentified objects.

(i) Type I AGN have an average spectral index of about 1.85 over 2 – 10 keV

(ii) Type II AGN have an average energy spectral index of about 1.2

(iii) sources with no optical spectra (thus far) have an energy spectral index of 1.5, or 1.1 for the hard-selected sources (5 - 8 kev).

Extrapolating to higher energies, it is evident that AGNs of Type II and (non-ROSAT) unidentified sources make up the bulk of the energy in the XRB.

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