

**X-RAY ABSORBED, BROAD-LINED, RED AGN AND THE COSMIC X-RAY
BACKGROUND**

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We have obtained XMM spectra for five red, 2MASS AGN, selected from a sample observed by Chandra to be X-ray bright and to cover a range of hardness ratios. Our results confirm the presence of substantial absorbing material in three sources which have optical classifications ranging from Type 1 to Type 2, with an intrinsically flat (hard) power law continuum indicated in the other two. The presence of both X-ray absorption and broad optical emission lines with the usual strength suggests either a small (nuclear) absorber or a favored viewing angle so as to cover the X-ray source but not the broad emission line region (BELR). A soft excess is detected in all three Type 1 sources. We speculate that this soft X-ray emission may arise in an extended region of ionized gas, perhaps linked with the polarized (scattered) light which is a feature of these sources. The spectral complexity revealed by XMM emphasizes the limitations of the low S/N Chandra data.

Overall, the new XMM results strengthen our conclusions (Wilkes et al. 2002) that the observed X-ray continua of red AGN are unusually hard at energies >2 keV. Whether due to substantial line-of-sight absorption or to an intrinsically hard or reflection-dominated spectrum, these 'red' AGN have an observed spectral form consistent with contributing significantly to the missing hard/absorbed population of the Cosmic X-ray Background (CXRB). When absorption and/or reflection is taken into account, all these AGN have power law slopes typical of broad-line (Type 1) AGN (Gamma ~ 1.9). This appears to resolve the spectral paradox which for so long has existed between the CXRB and the AGN thought to be the dominant contributors. It also suggests two scenarios whereby Type 1 AGN/QSOs may be responsible for a significant fraction of the CXRB at energies above 2 keV: 1) X-ray absorbed AGN/QSOs with visible broad emission lines; 2) AGN/QSOs with complex spectra whose hardness >2 keV is not detectable in the typically low S/N data of X-ray surveys. Even if absorption is present in only half of the population, the large number of 'red' AGN suggests a development of unification models, where the continuum source is surrounded, over a substantial solid angle, by the wind or atmosphere of an accretion disk/torus. X-ray observations of such AGN not only provide a check on the presence of absorption, but also a unique probe of the absorbing material. Improved information on their space density, in particular as a function of redshift, will soon be provided by Spitzer-Chandra wide area surveys, allowing better estimates of both the importance of red AGN to the full AGN population and their contribution to the CXRB.