S06a Light bending and the hard X-ray background

○ Poshak Gandhi (RIKEN), A.C. Fabian, T. Suebsuwong, J. Malzac, G. Miniutti

Light bending due to strong gravity has recently been invoked to explain variability and flux correlations between different bands in some accreting black holes. A characteristic feature of light bending is reflection-dominated spectra, especially if photon sources lie in the deepest parts of the gravitational potential within a few gravitational radii of the event horizon. We use the spectrum of the hard X-ray background in order to constrain the prevalence of such reflection-dominated sources. We first emphasize the need for reflection and explore the broad-band properties of realistic spectra that incorporate light bending. We then use these spectra, in conjunction with the observed 2–10 keV AGN distribution, evolutionary and obscuration functions (Ueda et al. 2003) in order to predict the hard X-ray background spectrum over 3–100 keV, and provide limits on the fraction of reflection-dominated sources, dependent on the flare height. Our results allow for a cosmologically-significant fraction of sources that incorporate strong light bending. The luminosity function based on intrinsic flare luminosities is derived. We discuss prospects for future hard X-ray missions such as NeXT and Simbol-X that can image such sources as well as confirm the precise spectral shape of the XRB near its peak, important for constraining the universal relevance of light bending.