
AGN spectral states from simultaneous UV and X-ray observations by XMM-Newton

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Abstract

It is generally believed that the supermassive black holes in active galactic nuclei (AGN) and stellar-mass black holes in X-ray binaries (XRB) work in a similar way. Koering et al. (2006) suggested that different types of AGN correspond to different spectral states of XRB. In our recent work, we extended their analysis by using data of higher quality - we used the whole XMM-Newton archive to extract a sample of about 1500 sources with high-quality simultaneous UV and X-ray measurements of AGN. The thermal disc component is estimated from the UV flux while the non-thermal flux is constrained from the measured 2-10 keV X-ray luminosity. Our results indicate that sources with the higher fraction of the X-ray flux tend to be radio-loud, have flatter X-ray spectra and UV spectrum inconsistent with the thermal accretion disc emission, as expected from the XRB hard state analogy, and vice versa for the soft states. Our study, therefore, provides an observational support to the hypothesis that accretion onto super-massive black hole work in a similar way as for the stellar-mass black holes in X-ray binaries, and that XRB and AGN follow similar evolutionary paths. This suggests that the AGN radio dichotomy of radio-loud and radio-quiet sources can be explained by the evolution of the accretion states.

Keywords: black hole, active galaxies, accretion

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