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Highly variable AGN in the XMM-Newton Slew Survey

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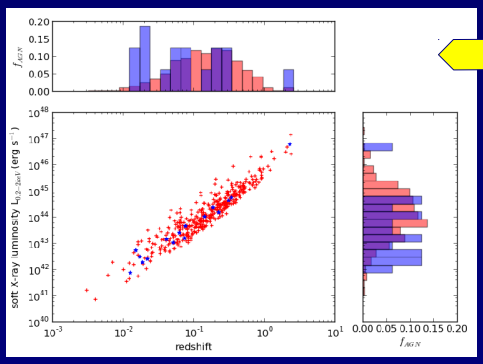
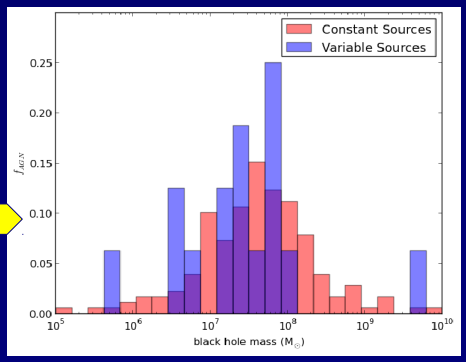
We investigate the properties of a variability-selected sample of AGN, with the aim of identifying the mechanisms which cause large amplitude soft X-ray variability on long time scales.

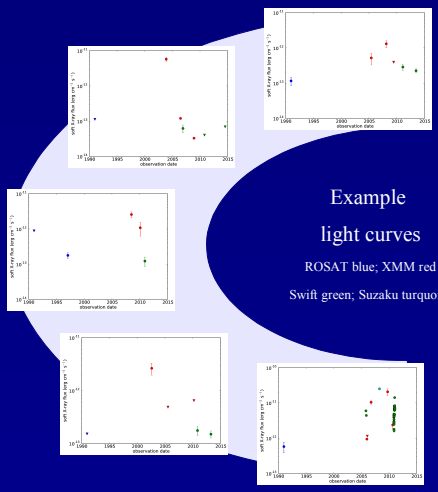
A sample of 24 sources was constructed from AGN which varied in soft X-ray luminosity by more than one order of magnitude over 10--20 years between ROSAT observations and the XMM Slew Survey. Follow-up observations were obtained with the Swift satellite.



We find the sample has global properties which differ little from a non-varying control sample.

A wide range of AGN types are present. The distribution of BH mass is consistent with the non-varying sample.

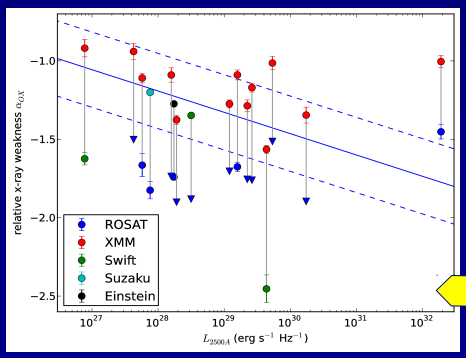




Example light curves

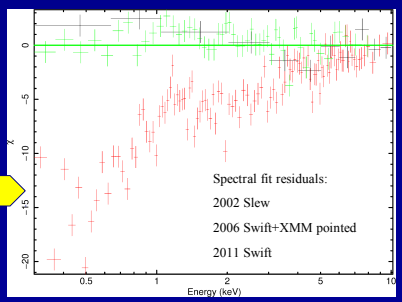
ROSAT blue; XMM red

Swift green; Suzaku turquoise



All the RQ sample have normal optical to X-ray ratios (α_{OX}) when at their peak, but are X-ray weak during their lowest flux points.

In this case, absorption can account for the variability, but this is not commonly the sole cause.



Conclusions

From this work, and previous studies on individual sources, we identify the variability mechanisms as: tidal disruption events (2), jet activity (2), change in absorption (3), thermal emission from the inner accretion disk (1) and variable accretion disk reflection (1).

Little evidence for strong absorption is seen in the remainder of the sample and single-component absorption can be excluded as the mechanism for most sources.