

BEPOSAX OBSERVATIONS OF MKN 110

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Mkn 110 is a bright, nearby Seyfert 1 galaxy, which underwent a long optical monitoring campaign, during the past 12 years. Optical observations show that Mkn 110 vary, both in flux and spectral shape. The intensity and width of its Broad Emission Lines (BELs) also vary, from typical Seyfert 1, to typical Narrow Line Seyfert 1 (NLSy1) values, so suggesting that this could be the first supermassive black holes where accretion state related transitions, as frequently observed in stellar-size black holes, have finally been observed.

To verify these suggestions we asked to monitor Mkn 110 with BeppoSAX with three 50 ksec observations 6 months apart. The goal of the proposal was to observe spectral variations in X-ray, already suggested by previous, existing ROSAT and ASCA observations of the same source. The first of these three SAX observations was taken on May 2000, and lacks the Low-Energy instrument (0.1-2 keV is the band in which NLSy1 and Sy1 X-ray spectra differ most).

P. Casella (a "visting student" who worked on this project for the last 6 months) reduced and analyzed the BeppoSAX and the ROSAT and ASCA data of this source, and we started to write a paper on this. Our preliminary results are: (a) the source varied both in flux and spectral shape between the three BeppoSAX observations, and (b) the spectral variability is correlated with the intensity changes (i.e. the 0.1-100 keV spectrum steepens as the source brightens). (c) The spectral variability becomes even more dramatic when the SAX data are compared with the ROSAT-PSPC and ASCA data (even after allowing for an additional systematic uncertainty of $\Delta\Gamma = -0.2$ in the PSPC spectral slope, to account for the observed ASCA-ROSAT cross-calibration uncertainties). (d) The flux and photon index during the first of the two ROSAT-PSPC observations are the highest measured in X-ray for this source, and the soft X-ray slope is close to those commonly seen in NLSy1. (e) During the soft-and-high ROSAT-PSPC state, we also detected a high significance 1 keV absorption feature, similar to those frequently observed in low resolution spectra of NLSy1s.

This work has already produced a poster-presentation (P. Casella et al., 2002) at the recent HEAD meeting in Albuquerque.