

One of the new discoveries with XMM-Newton is the detection of sharp spectral drops above about 7 keV. After 3 years of intensive investigations, the physical nature is still unclear. We show that XMM-Newton observations require long exposure times to solve this outstanding physical problem. XEUS does have the capabilities to reveal the physical nature of these high-energy features detected in some NLS1s with moderate exposure times.

One of the open questions which still requires further investigations is the detection of dramatic spectral drops above 7 keV in Narrow-Line Seyfert 1 Galaxies. Presently two models provide an acceptable fit to the data, the partial covering model (Holt et al. 1980) and the light bending model (Fabian et al. 2002). With XMM-Newton both models give an acceptable fit to the data (c.f. Fig. 1) within moderate 40 ks observations.

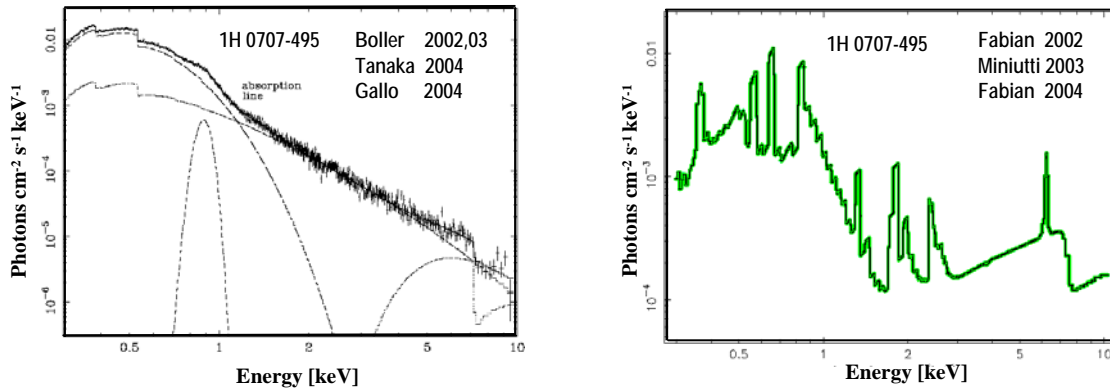


Fig. 1, Left panel: Partial covering model to explain the 0.3-10 keV spectral energy distribution of 1H 0707-495. A patchy high density absorber associated with the accretion disc causes the photoelectric absorption edge above 7 keV and the strong soft X-ray excess emission from the accretion disc which reaches the observer nearly unabsorbed.

Right panel: Reflection dominated model for 1H 0707-495 in its low state. The sharp spectral drop is explained by the blue horn of an high equivalent width Fe K α emission line. Strong light bending effects play an important role in this scenario. Both, partial covering and light bending model explain the dramatic spectral drops above 7 keV. XEUS will allow us to discriminate between both models (c.f. Fig. 2).

In Fig. 2 we show that with XEUS we will be able to discriminate between both models. The simulations show that a partial covering model cannot be fitted with a reflection model and opposite. XEUS observation will be able to discriminate between absorption dominated- and light bending dominated models.

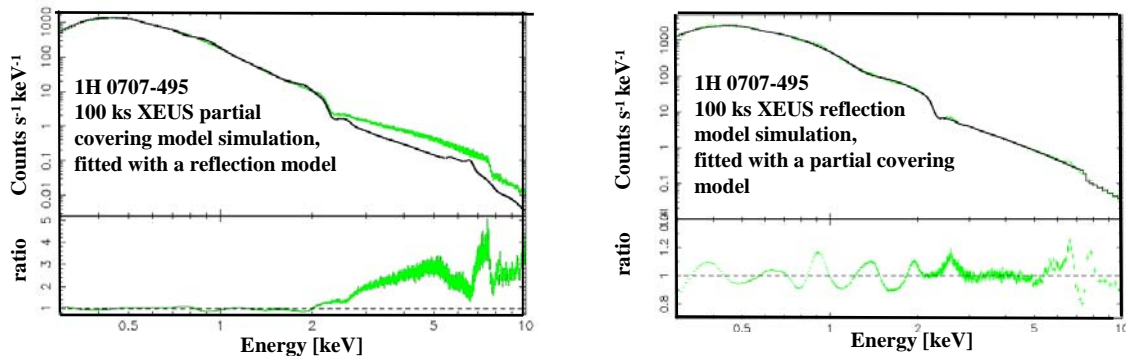


Fig. 2: XEUS simulation for 1H 0707-495 based on the XMM-Newton observation. The simulated partial covering model was fitted with a reflection model (left panel) and a reflection model was fitted with a partial covering model (right panel). Significant residua indicate that XEUS can discriminate between the two models.

References:

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