

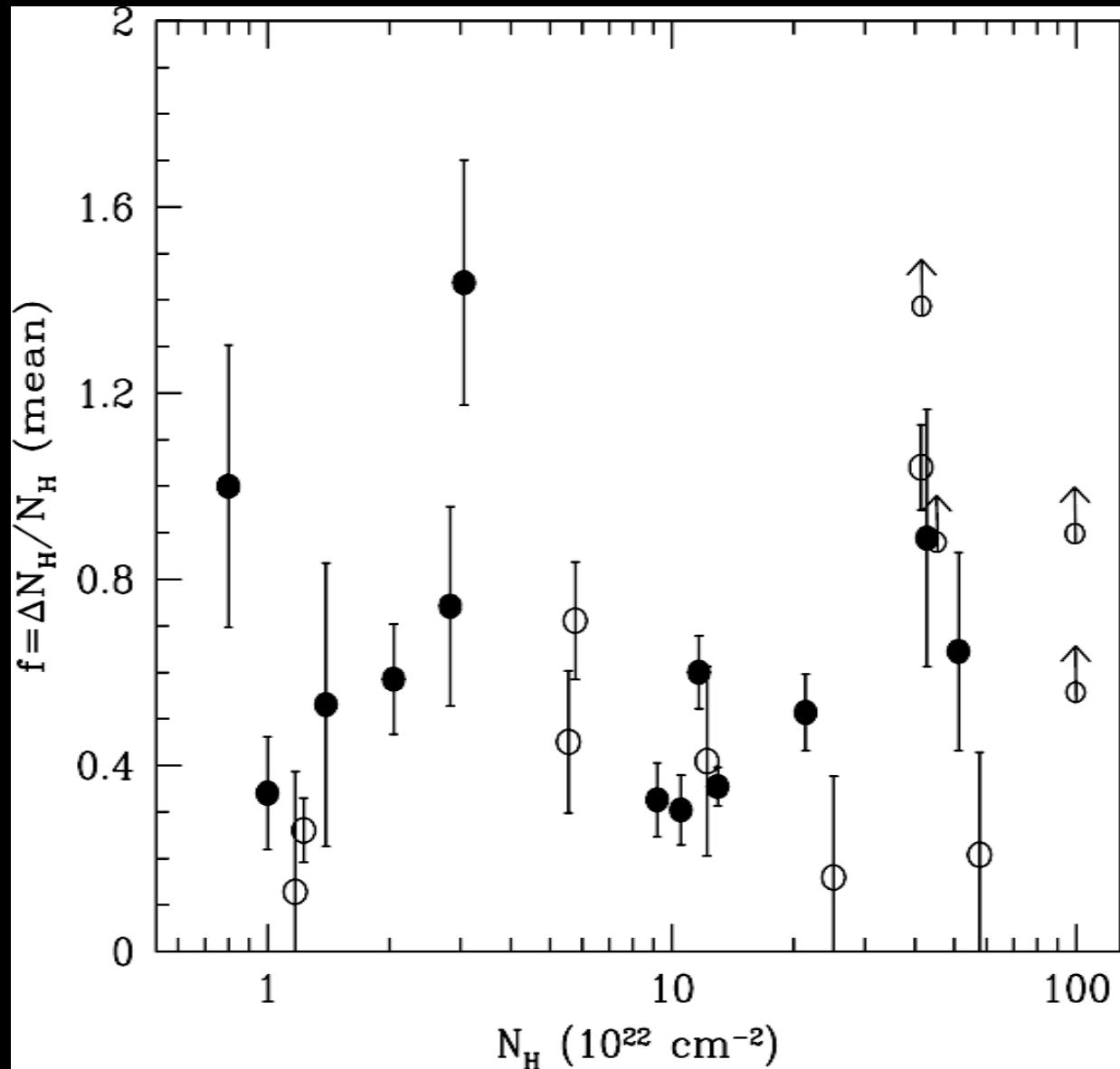
AGN structure from X-ray Absorption variability

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Ubiquitous Variability of N_{H} in Seyfert Galaxies



N_{H} variable in 23/25 sources

Timescales from months to years

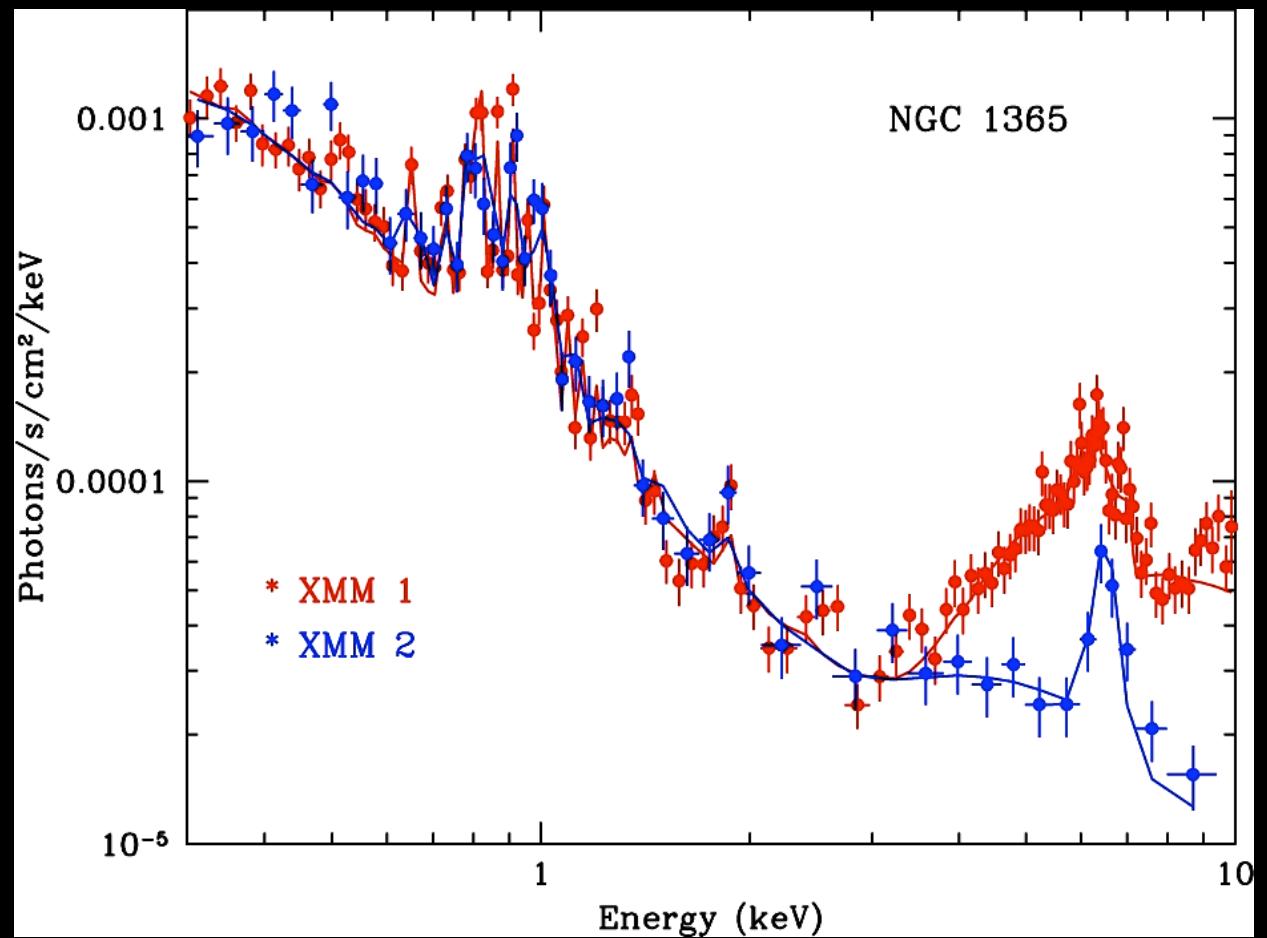


Clumpy absorber
Sub-parsec distance

NGC 1365: The best laboratory to investigate the absorber in obscured AGN

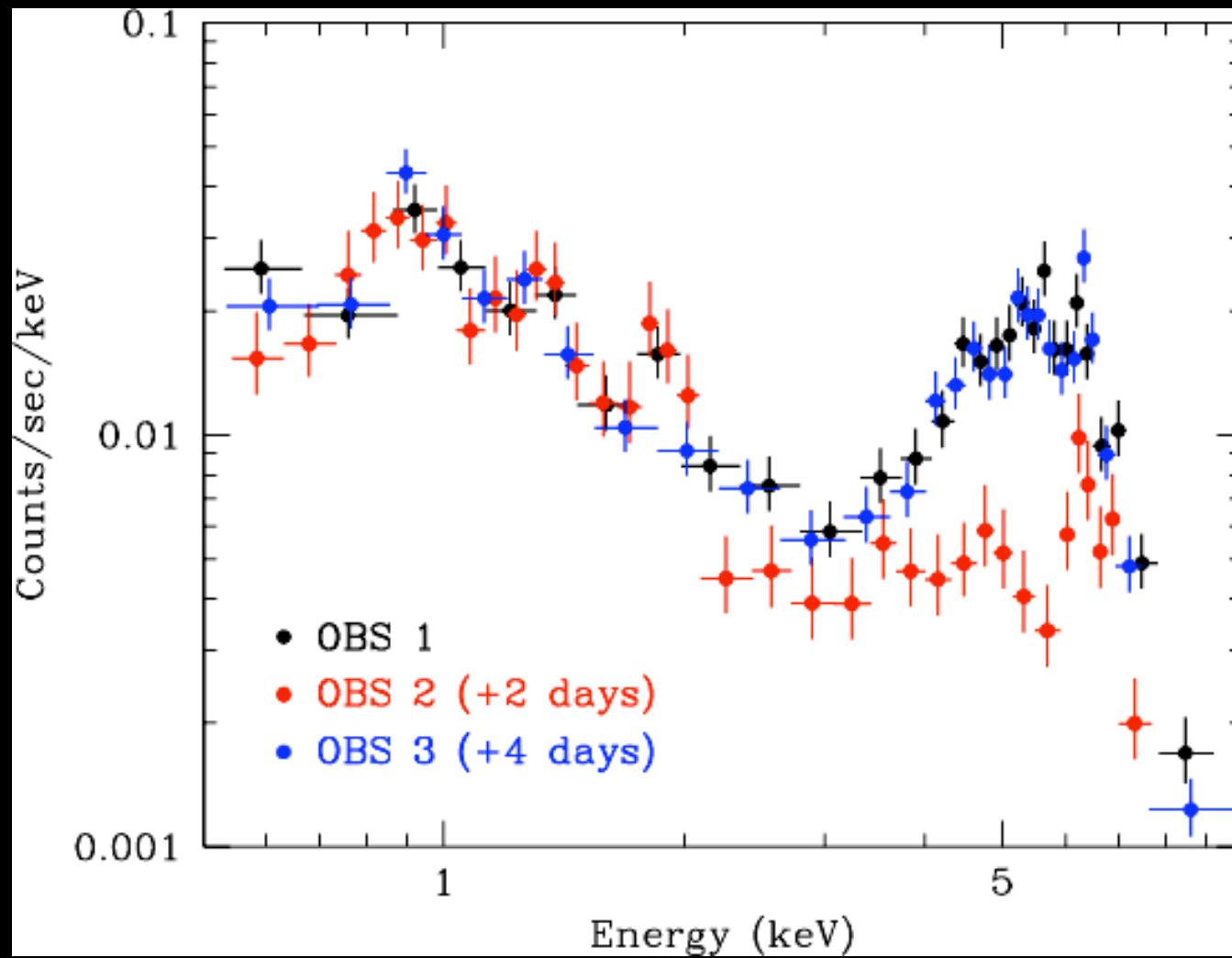
Hard X-ray observations:

ASCA (1995)	40 ks
BeppoSAX (1997)	30 ks
Chandra (Dec 2002)	15 ks
XMM 1 (Jan 2003)	17 ks
XMM 2 (Jan 2003)	10 ks
XMM 3 (Aug 2003)	15 ks
XMM 4 (Jan 2004)	60 ks
XMM 5 (Aug 2004)	60 ks
Chandra (Apr 06)	6x15 ks
XMM 6 (May 07)	4.5 days
Suzaku (Jan 08)	4 days



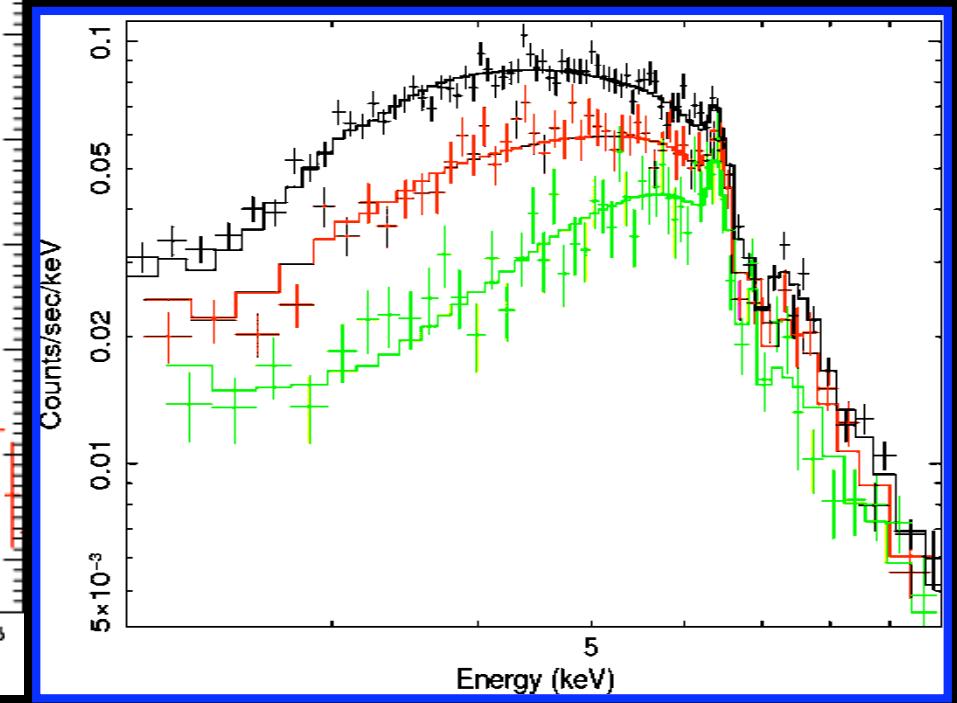
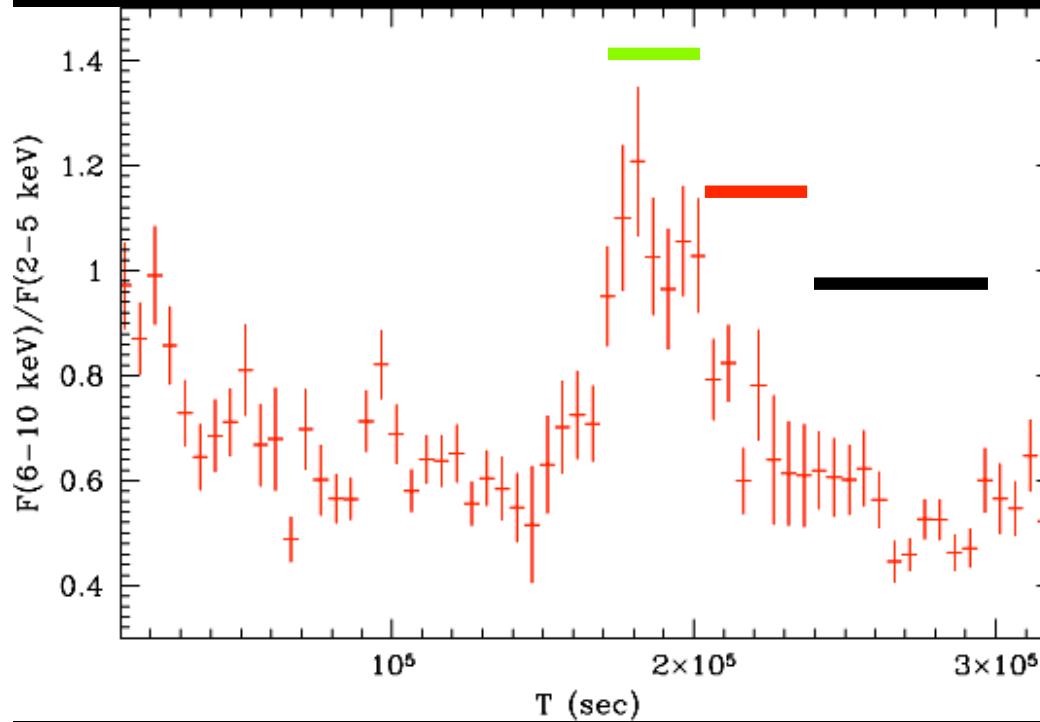
Two methods:

1. Campaigns of snapshot observations within ~a few days



Two methods:

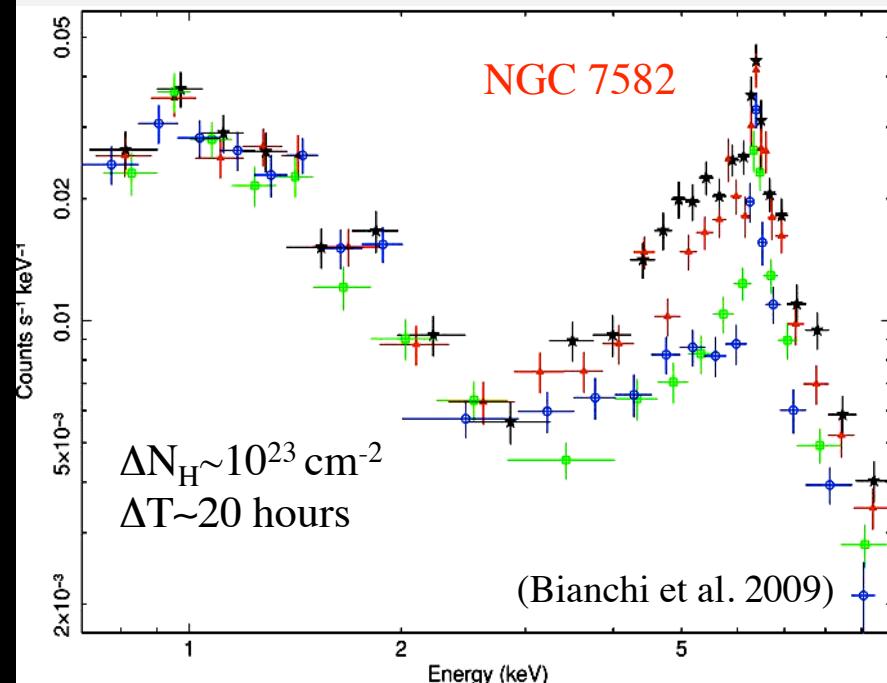
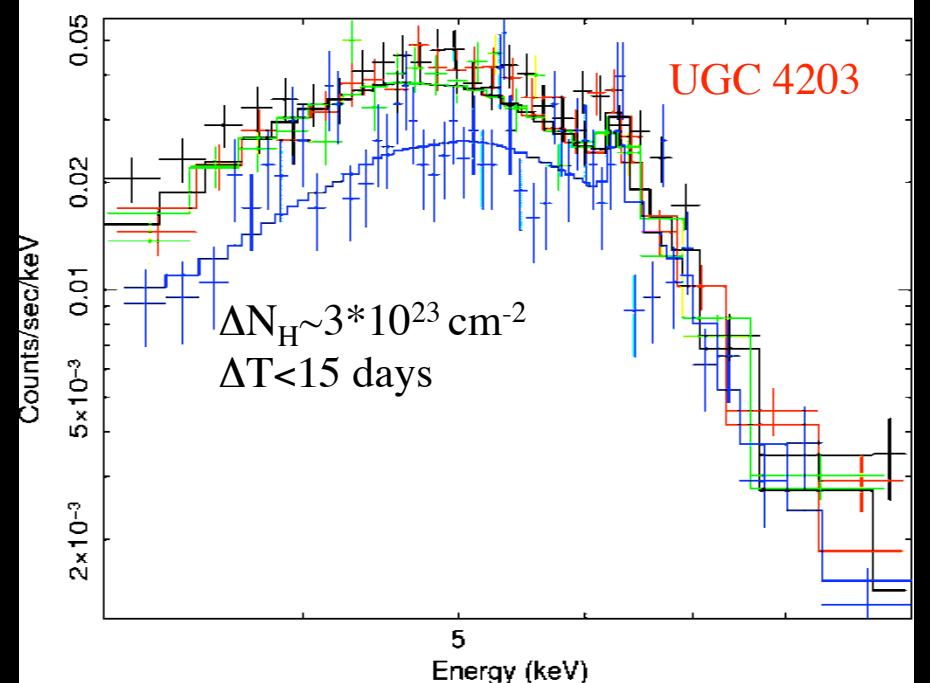
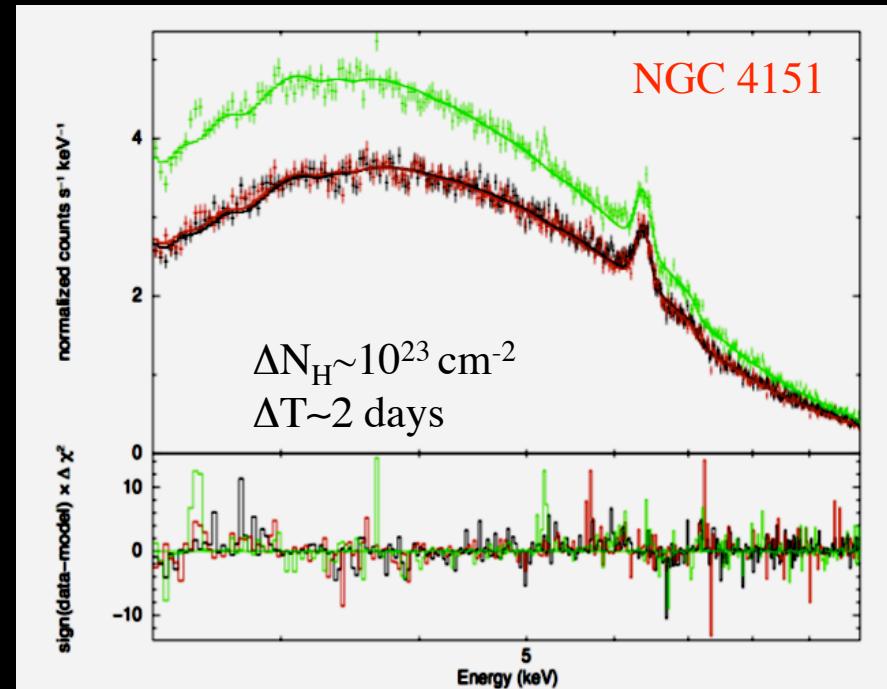
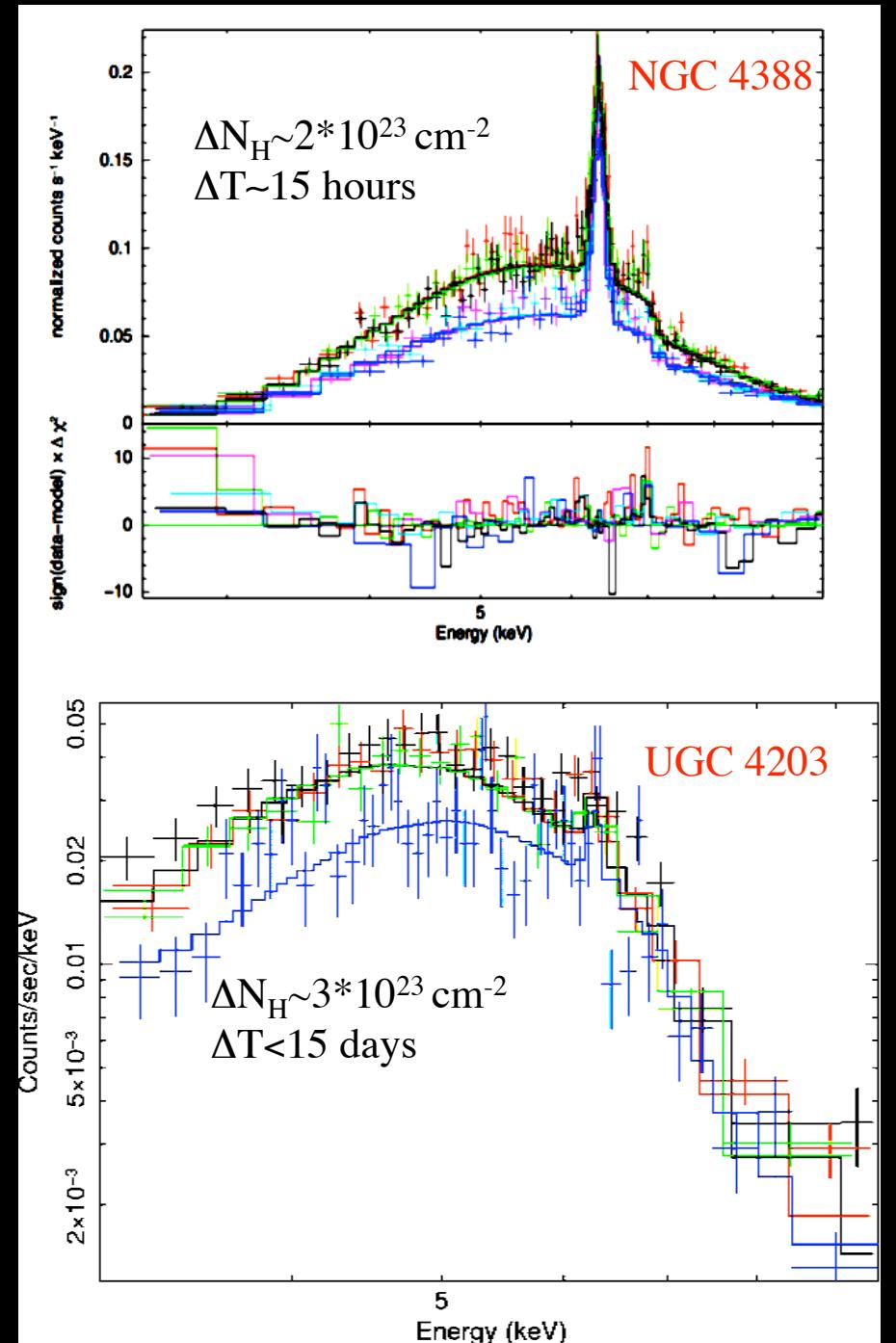
2. Analysis of HR light curves in long observations



Goals:

- 1. Finding more sources with eclipses in ~hours-days**
- 2. Measuring the physical properties of the clouds**

1. Finding more sources with eclipses in \sim hours-days



General results:

Eclipses of the X-ray source are COMMON in nearby AGN

$$\Delta N_H \sim 10^{23}\text{--}10^{24} \text{ cm}^{-2}$$

$$V > 10^3 \text{ km/s}$$

$$D \sim 10^{13} \text{ cm}$$

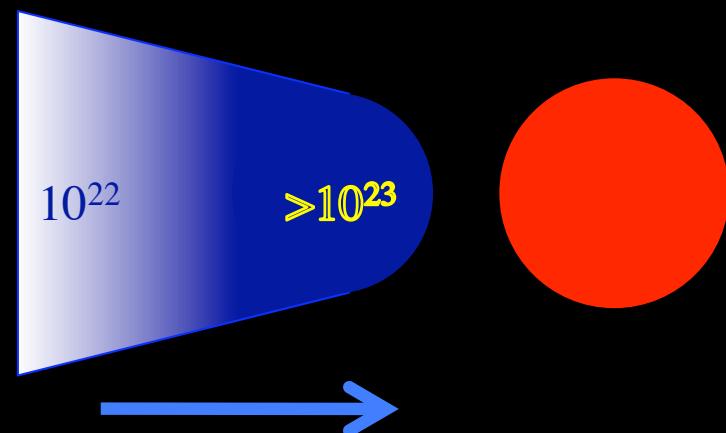
$$n \sim 10^{10}\text{--}10^{11} \text{ cm}^{-2}$$



X-ray absorber = BLR clouds

2.Properties of the absorbing (BLR) clouds:

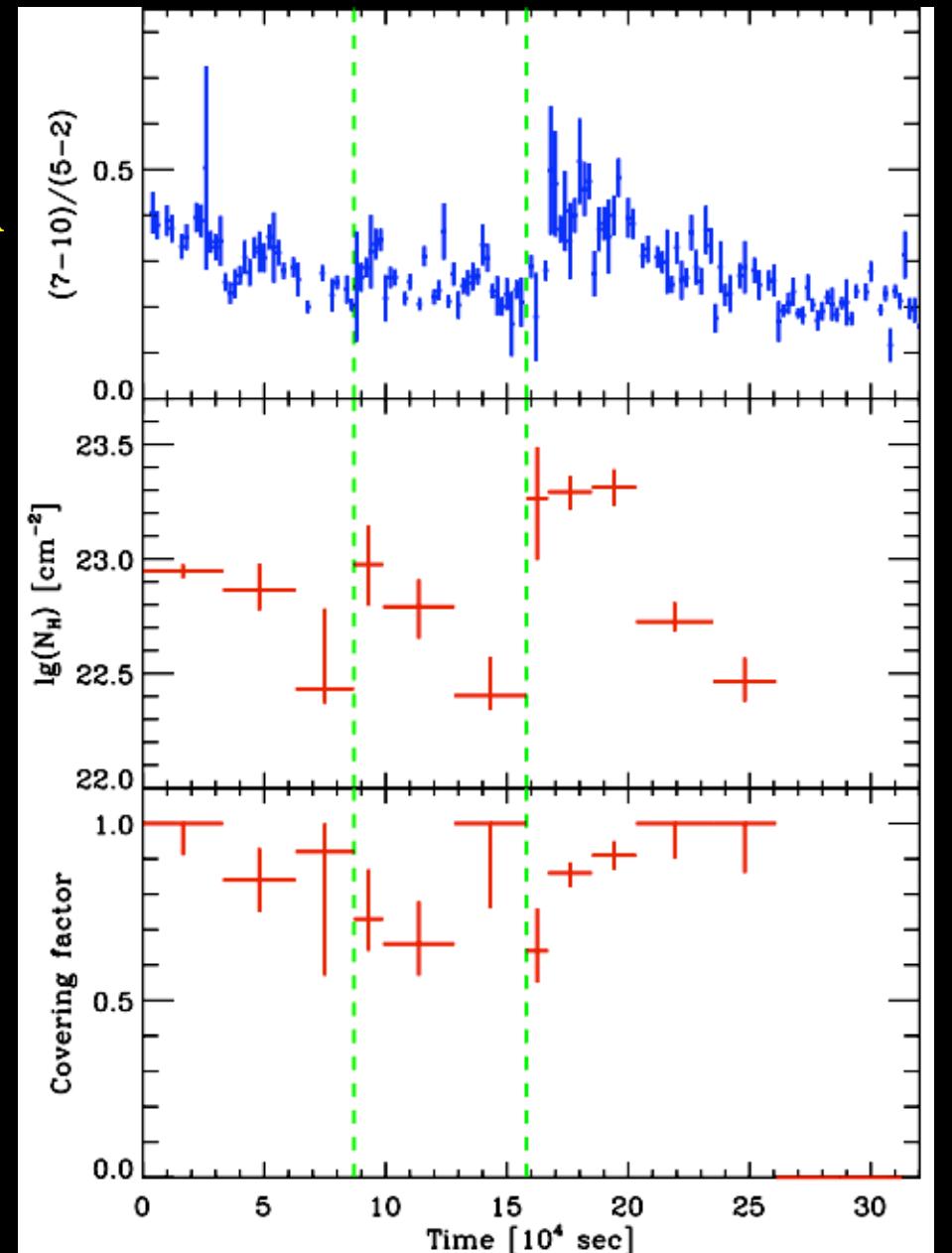
Time-resolved analysis of
the Suzaku observation of
NGC 1365



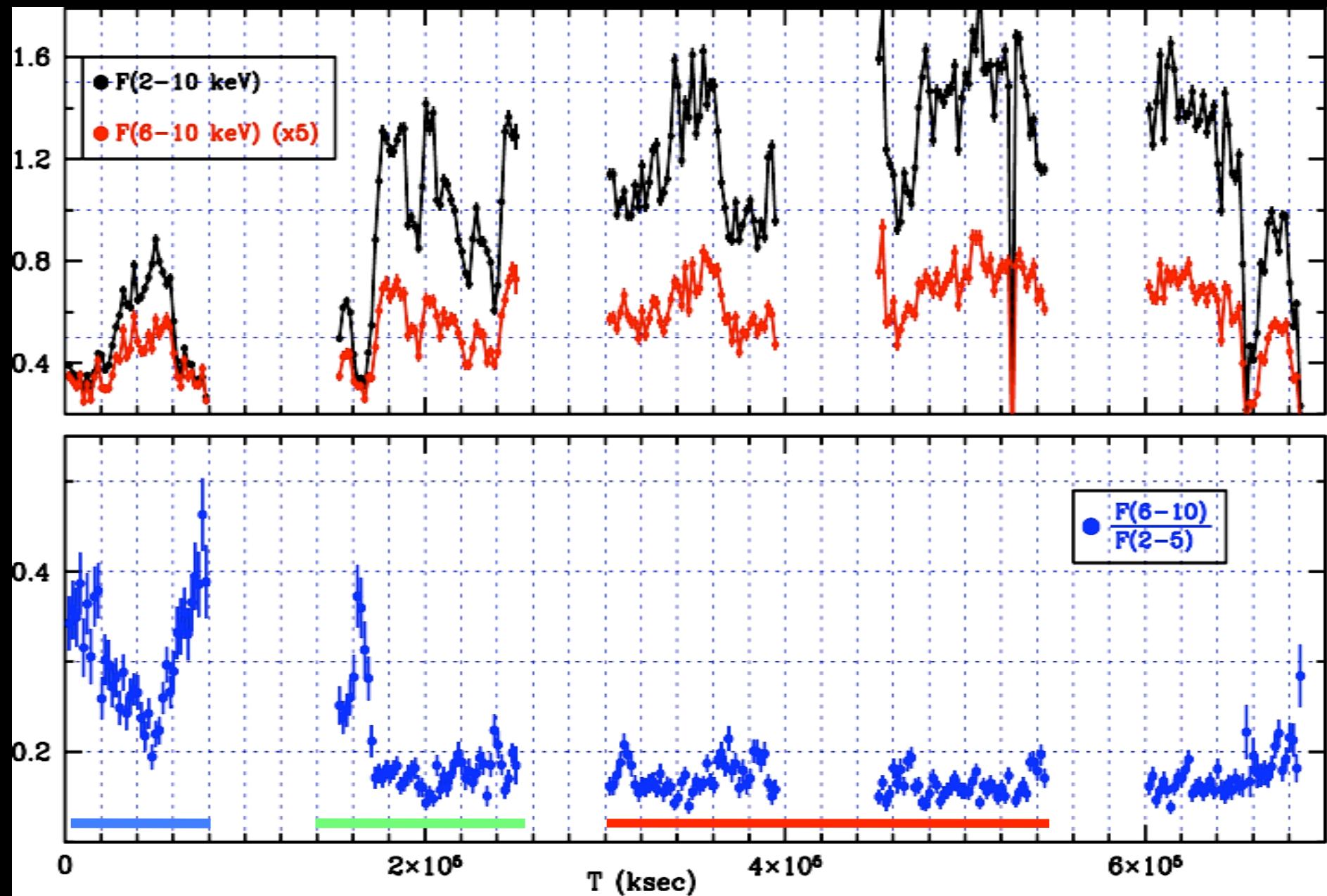
HR

N_H

CF



Properties of the absorbing clouds: XMM long look of Mrk 766



Mkn 766 1st orbit

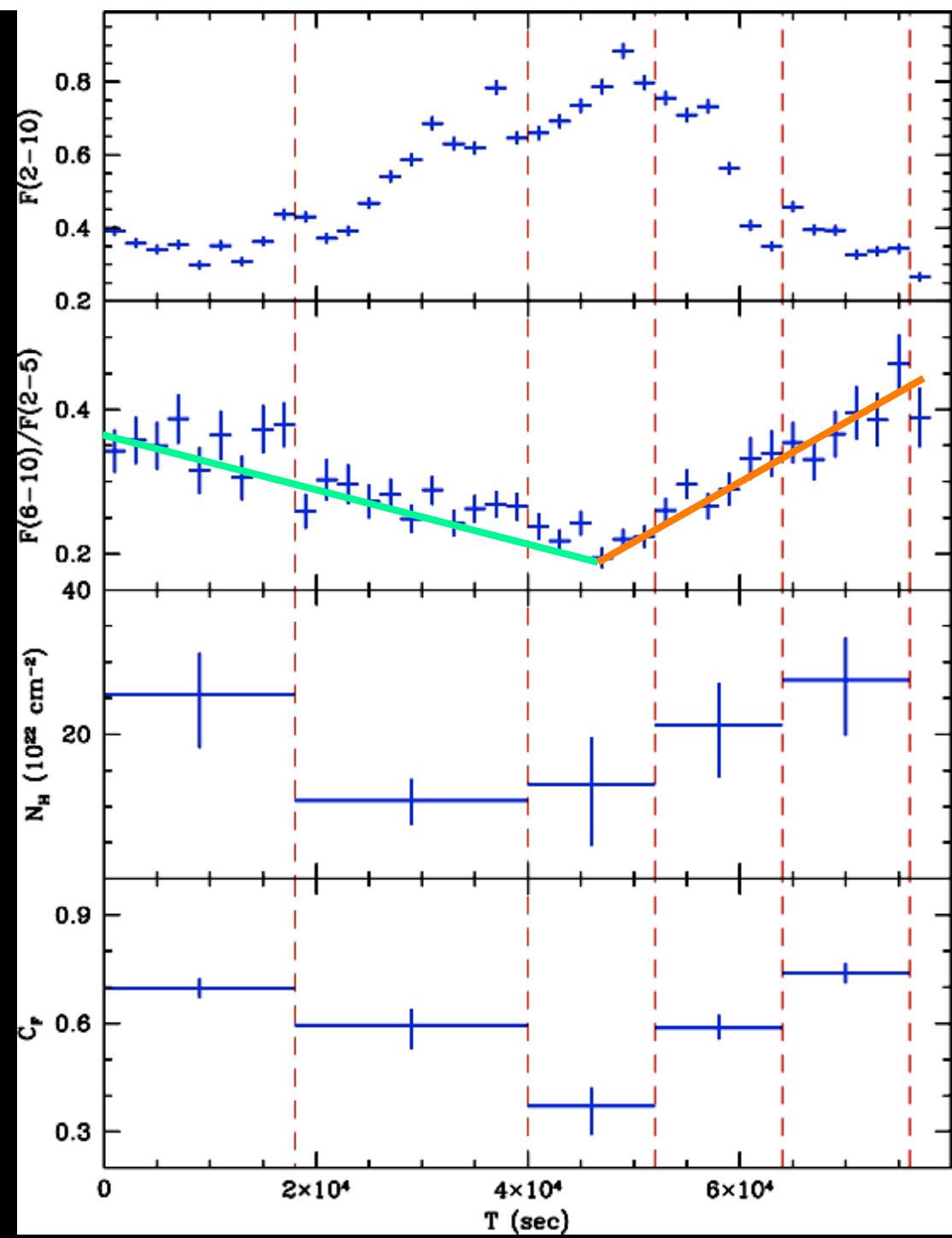
- Possible cometary structure
- Different cloud velocity

Flux

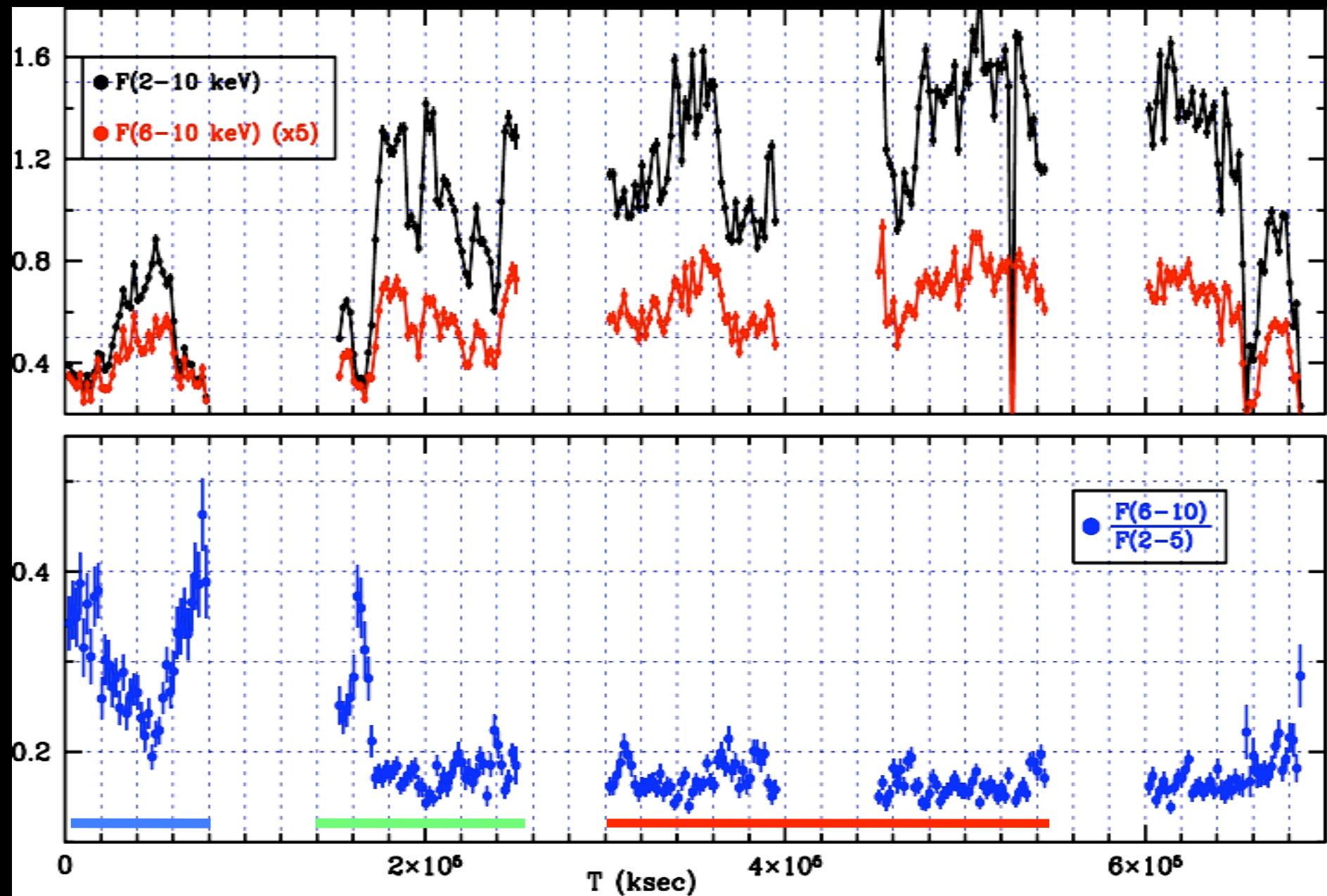
HR

N_H

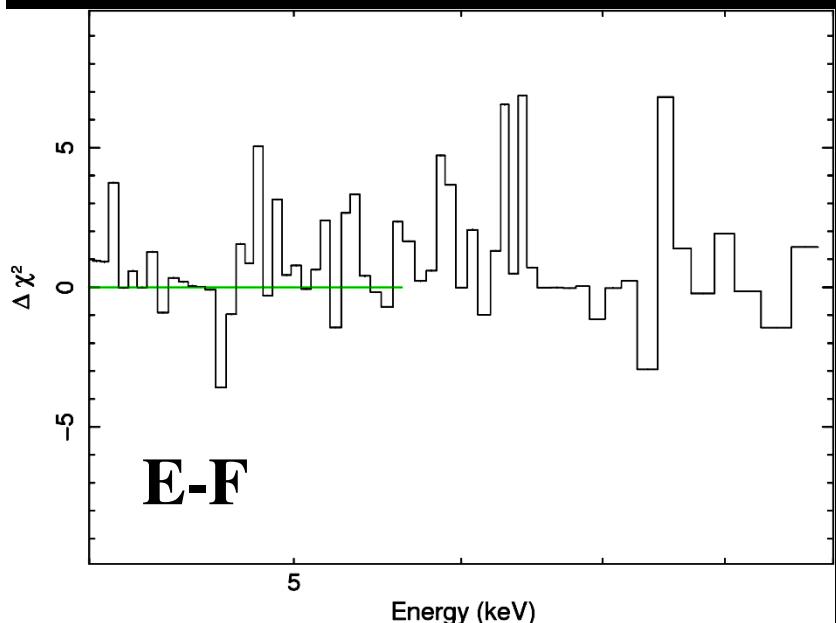
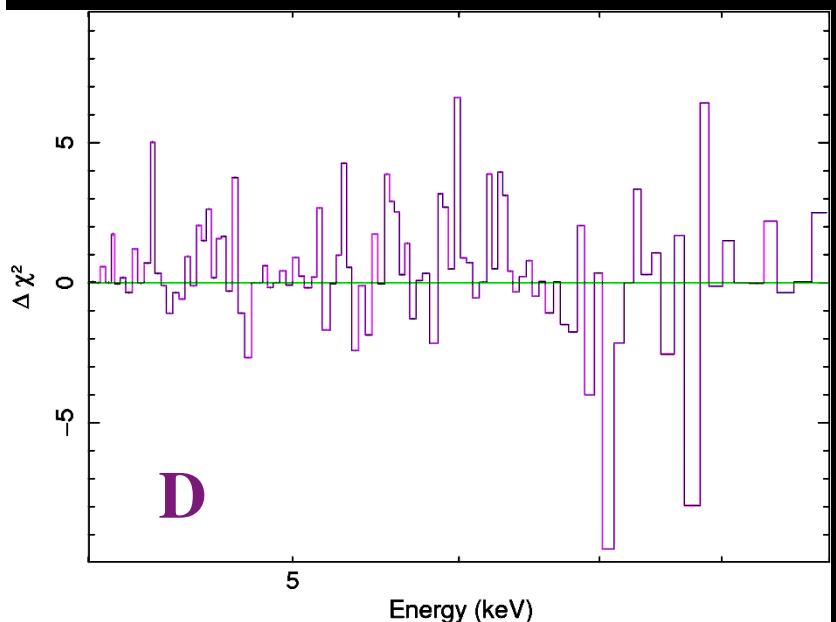
C.F.



Properties of the absorbing clouds: XMM long look of Mrk 766



Mkn 766 - 2nd orbit

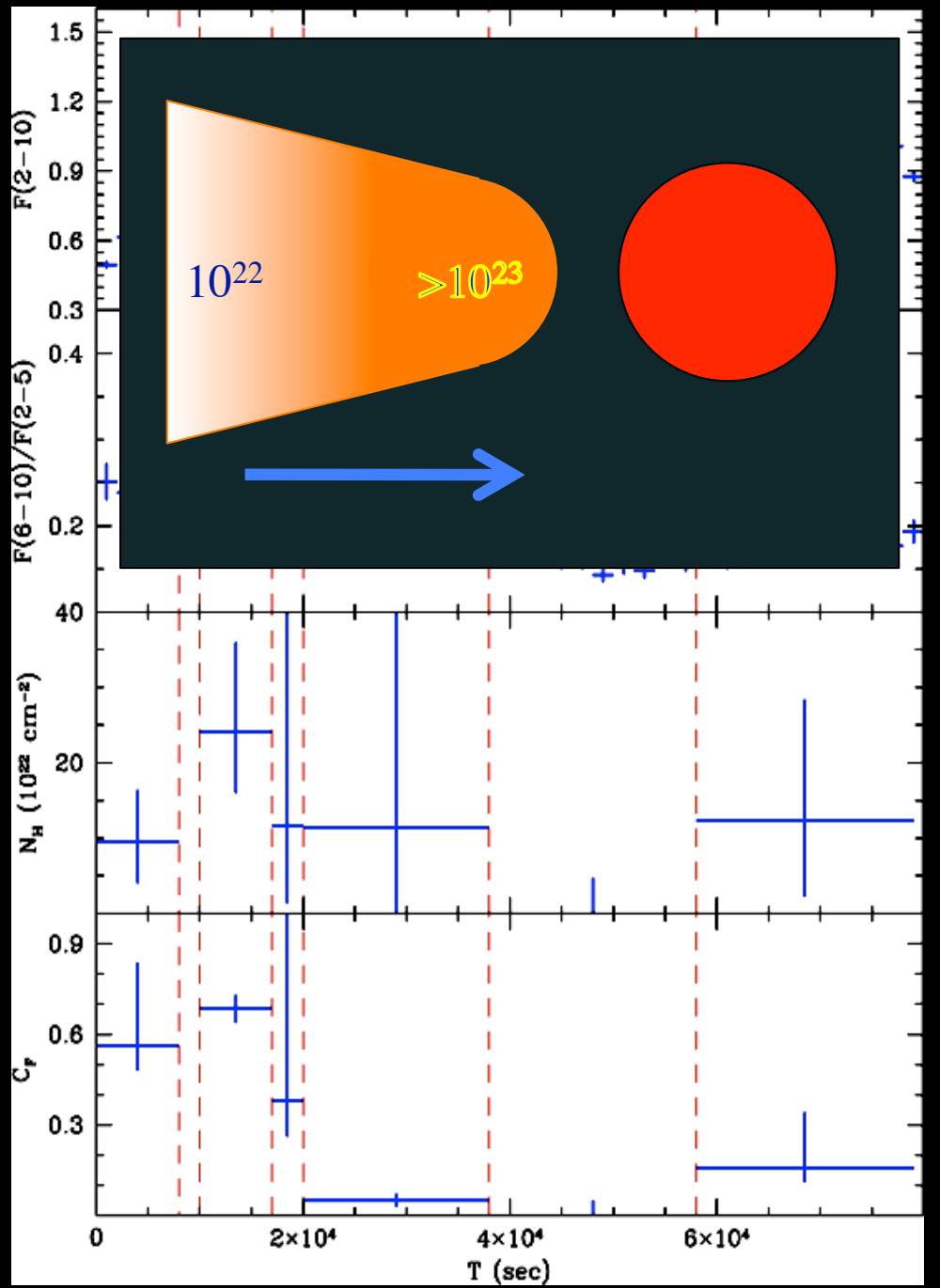


Flux

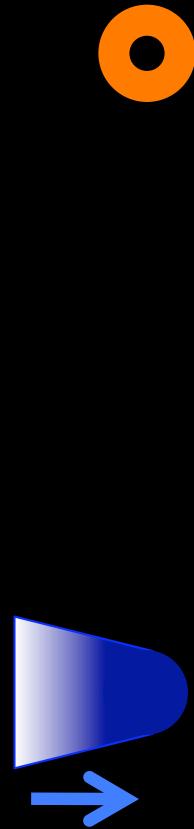
HR

N_H

C.F.



NGC 1365



MKN 766

