

**X-ray observations of NGC 1365:
Time-resolved eclipse of the X-ray source**

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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

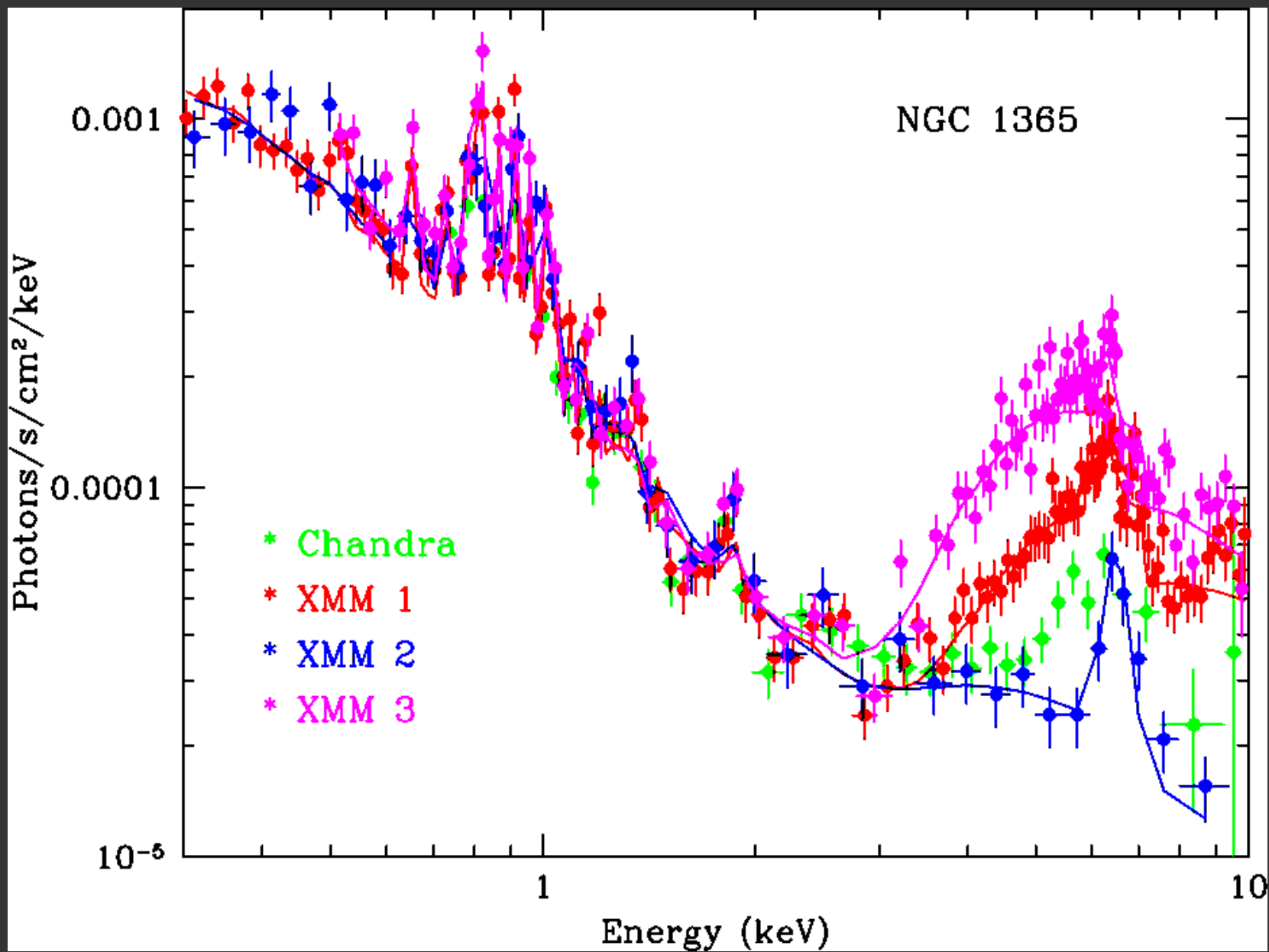
XMM 5 (Aug 2004) 60 ks

Chandra (Apr 06) 6x15 ks

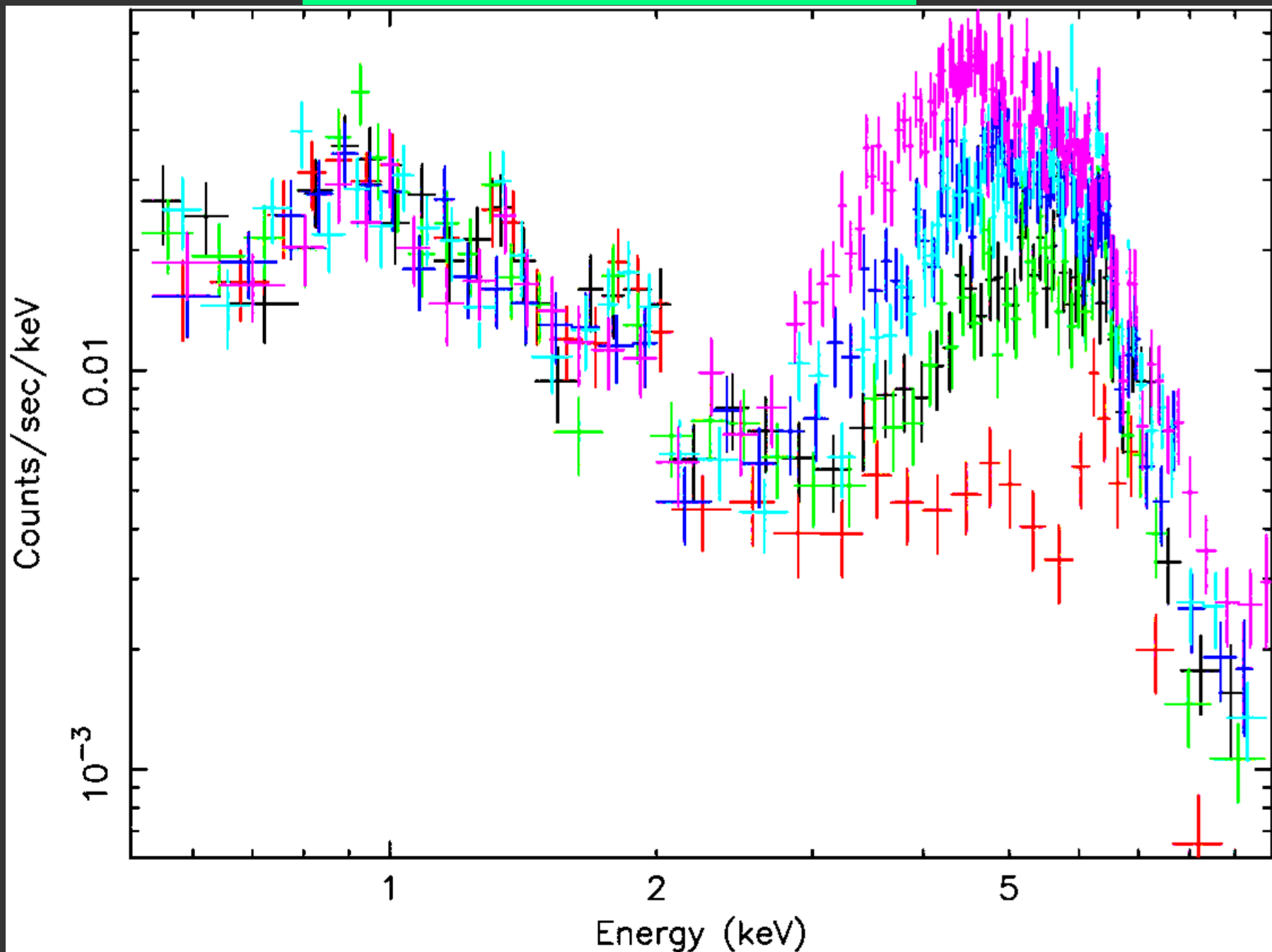
XMM 6 (May 07) 4.5 days



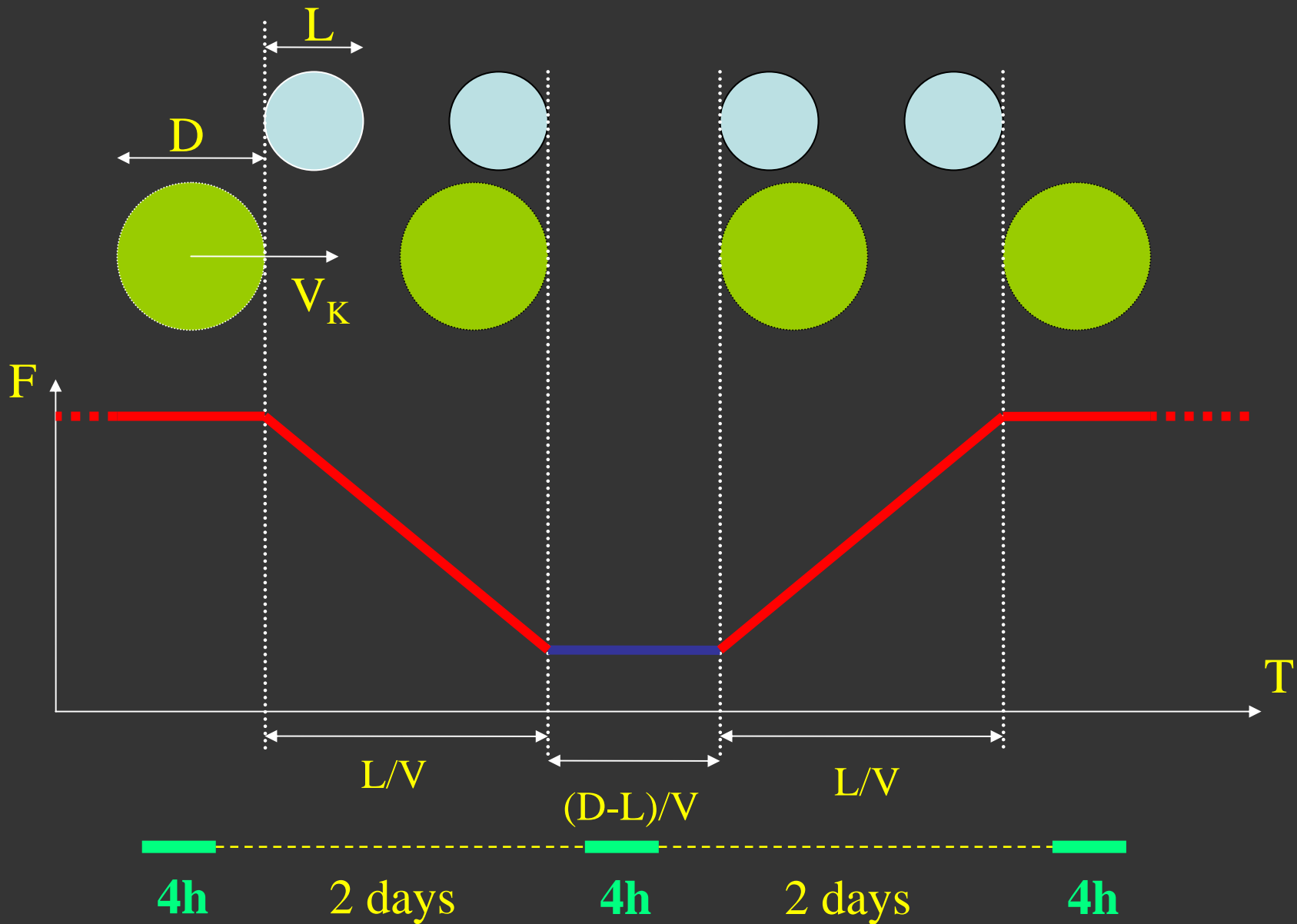
NGC 1365: Summary of past spectral variability



New Chandra observations



Complete occultation in ~ 2 days



Complete occultation in ~ 2 days

→ Dimensions of the X-ray source:

$$D = V \times T$$

If $V \sim 10^4$ km/s ----> $D \sim 10^{14}$ cm

→ Can't be much higher (to avoid overionization,
from iron line width)

→ If lower, even smaller X-ray source

Black hole mass in NGC 1365:

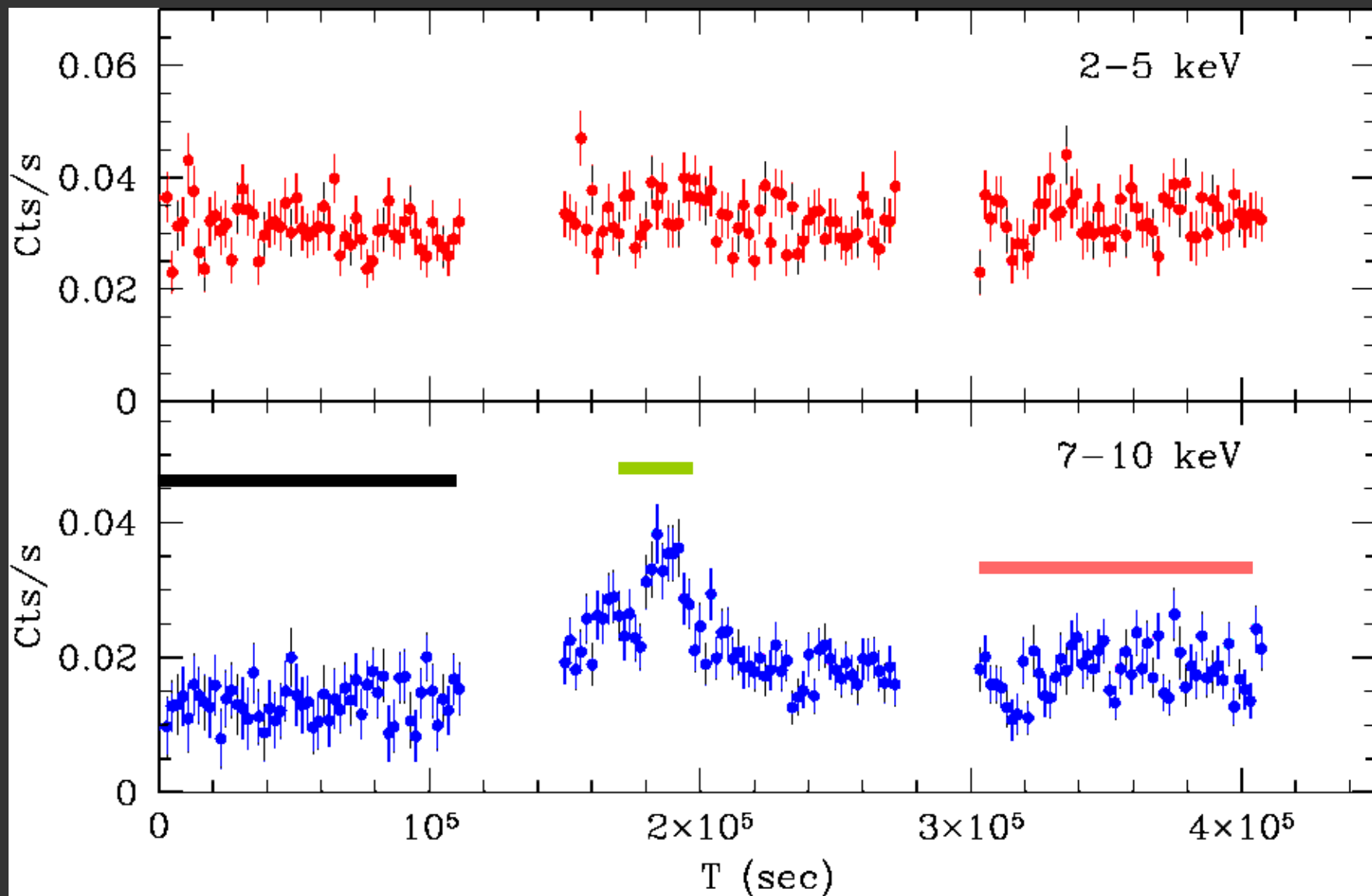
$\text{Log } M_{\text{BH}} / M_{\text{sun}} = 7.3$ (0.3,0.3) from M-sigma corr (Ferrarese et al. 2005)

$\text{Log } M_{\text{BH}} / M_{\text{sun}} = 7.86$ (0.15,0.3) from M- L_K corr (Marconi & Hunt 2003)

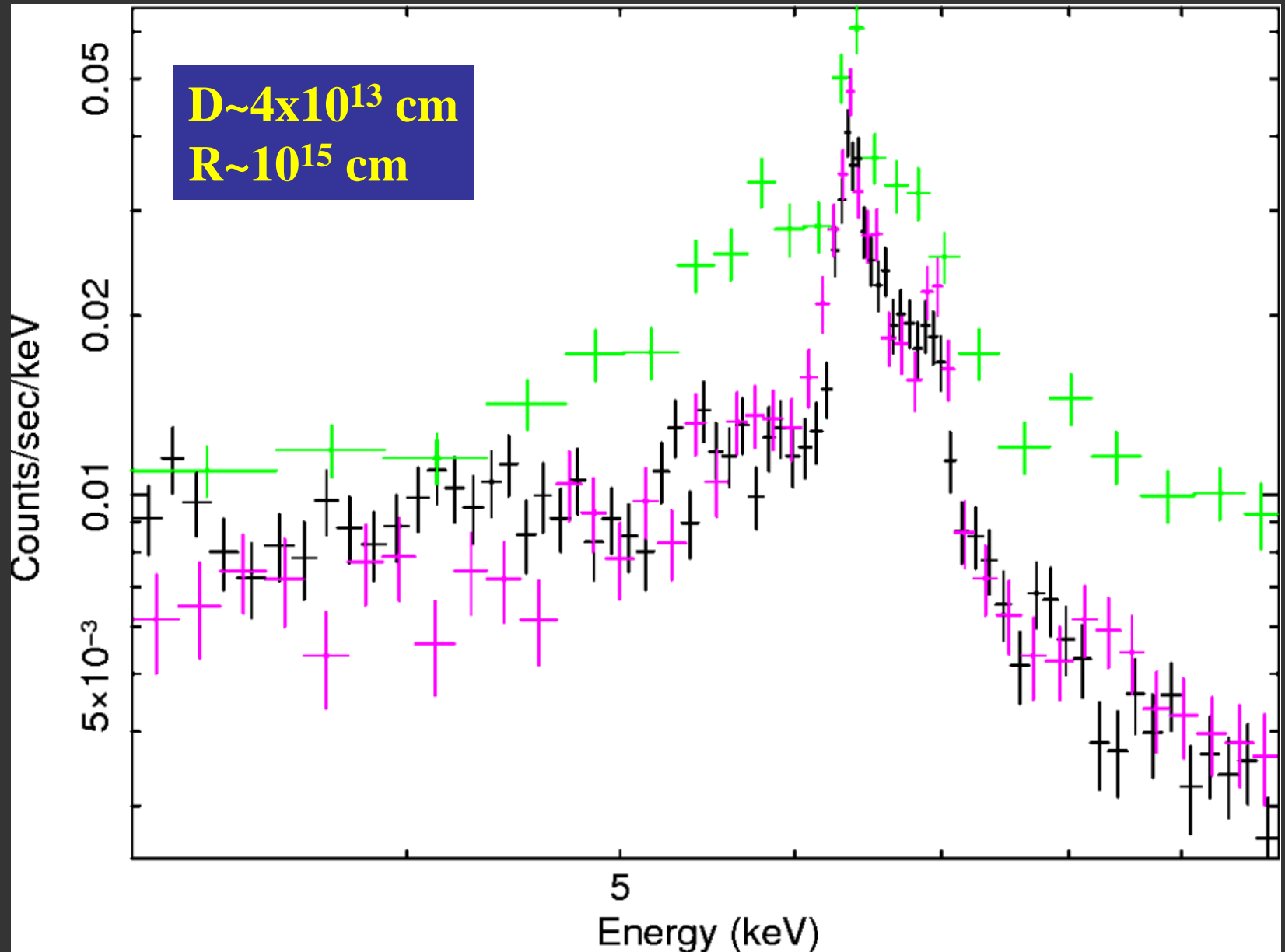
---> X-ray source within $\sim 10 R_G$ from the black hole

---> X-ray C-thick absorber at \sim a few 10^{15} cm from the BH

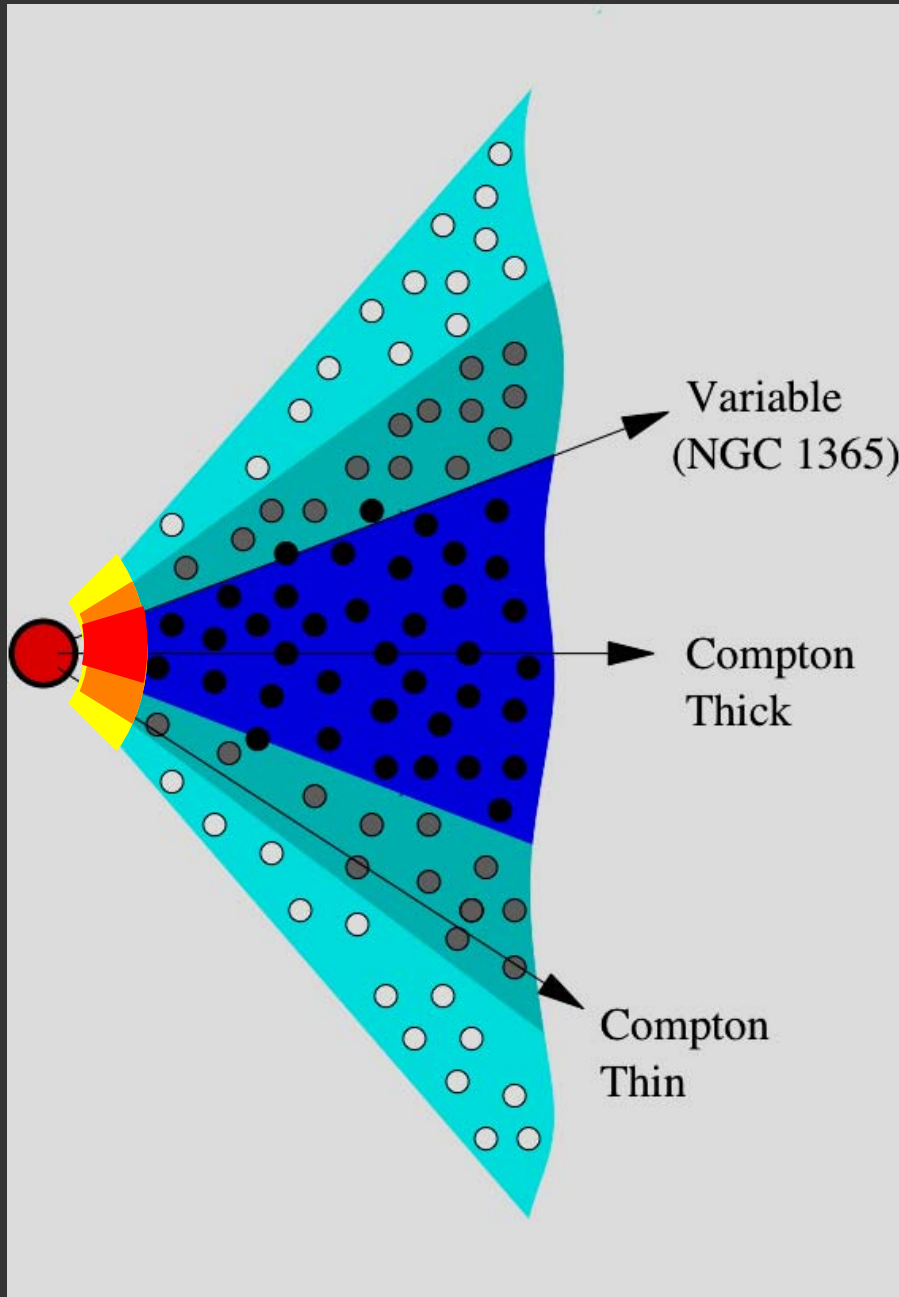
NGC 1365: long XMM-Newton observation



NGC 1365: long XMM observation



NGC 1365: uniqueness



few bright sources

with $10^{23} < N_{\text{H}} < 10^{24} \text{ cm}^{-2}$

Few other known cases of
changing-look AGNs

**A new Chandra
campaign
on UGC 4203**

**Systematic analysis of
XMM-Newton catalog to
search for N_{H} variations
within single observations**