ACIS background

(and bad pixels)

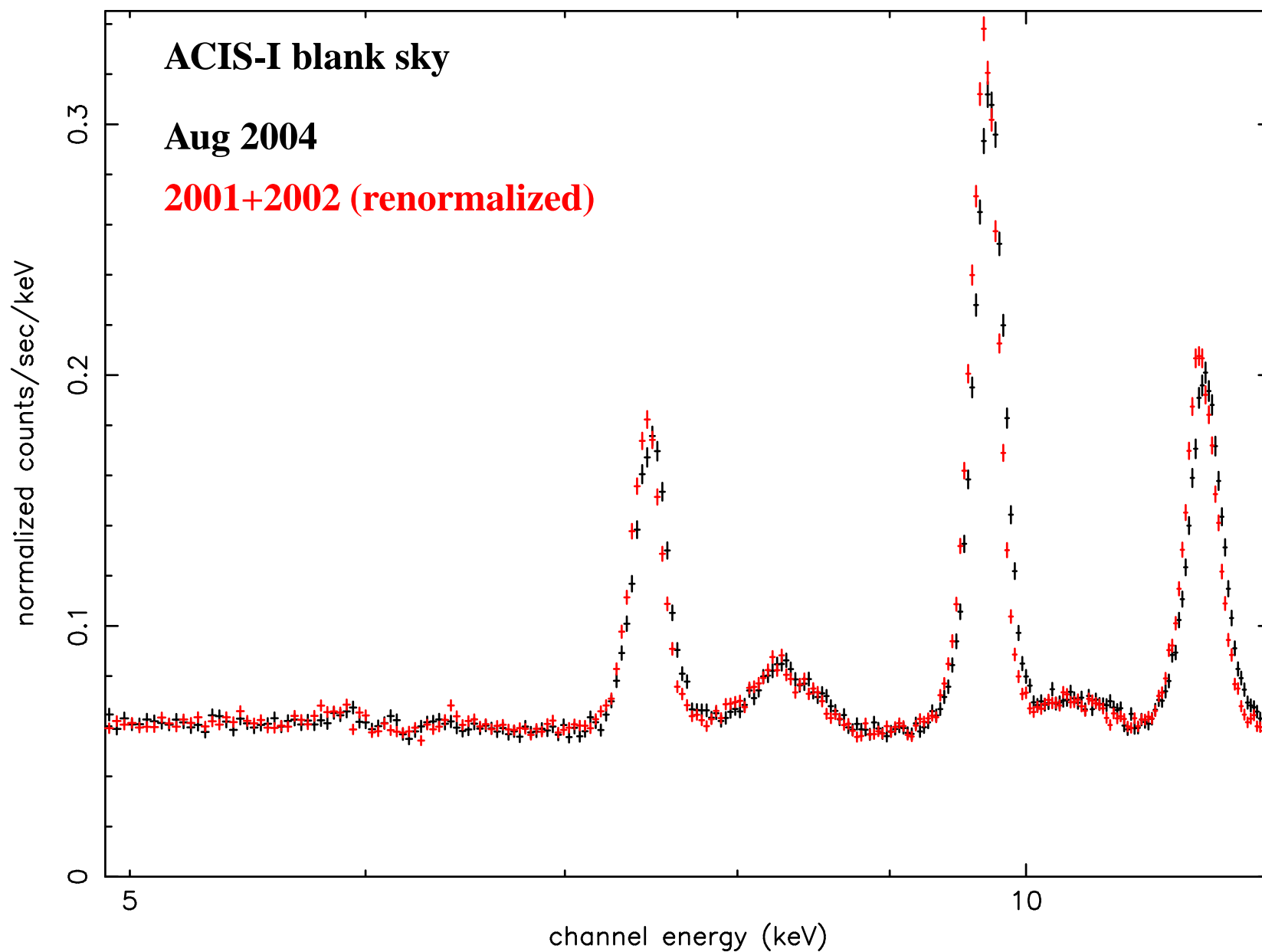## Maxim Markevitch

October 2004

Total telemetered rates

default energy filter (3750 ADU)

Background constancy

ACIS-I blank sky

Aug 2004

2001+2002 (renormalized)
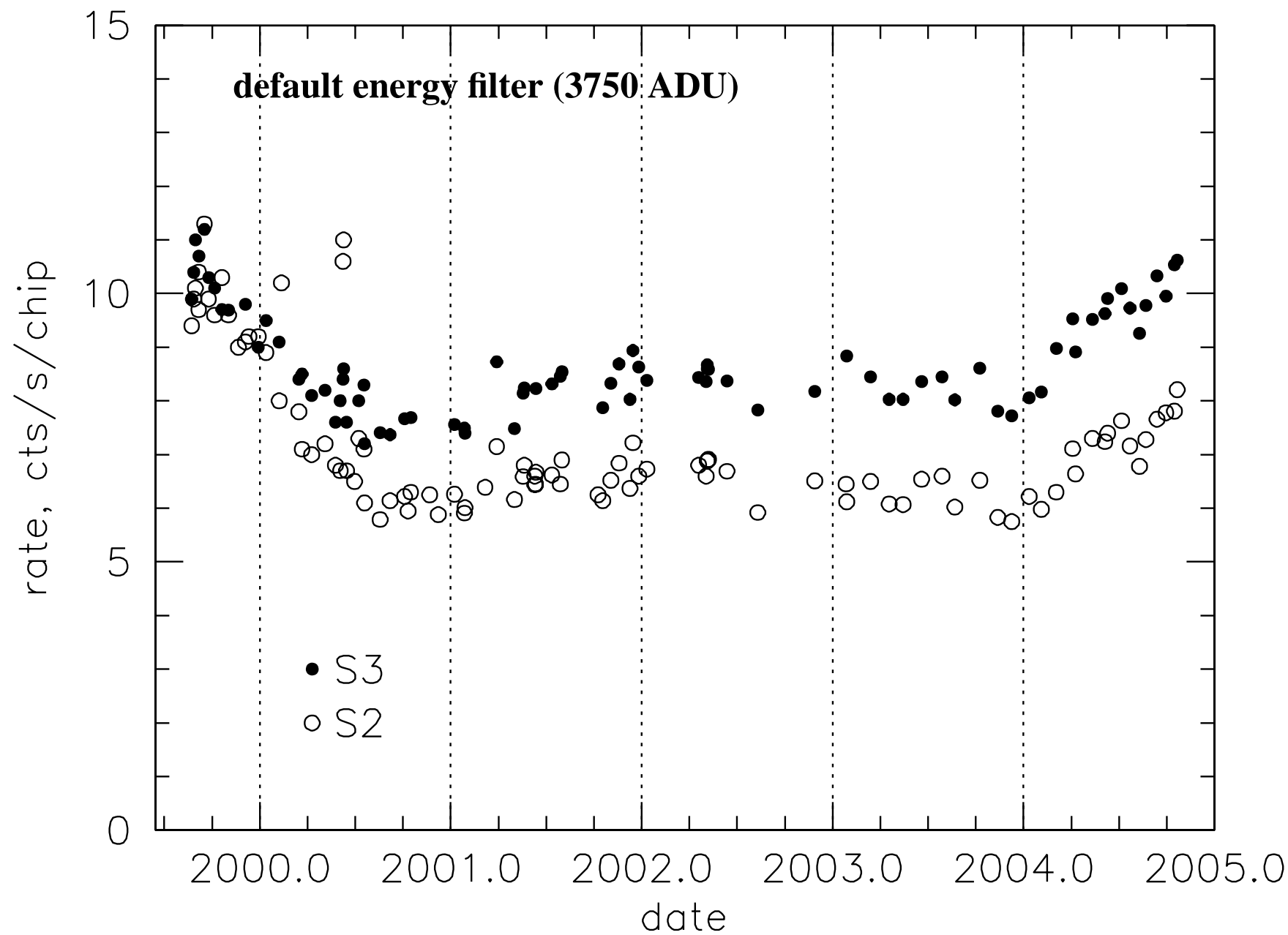
Background constancy (contd.)
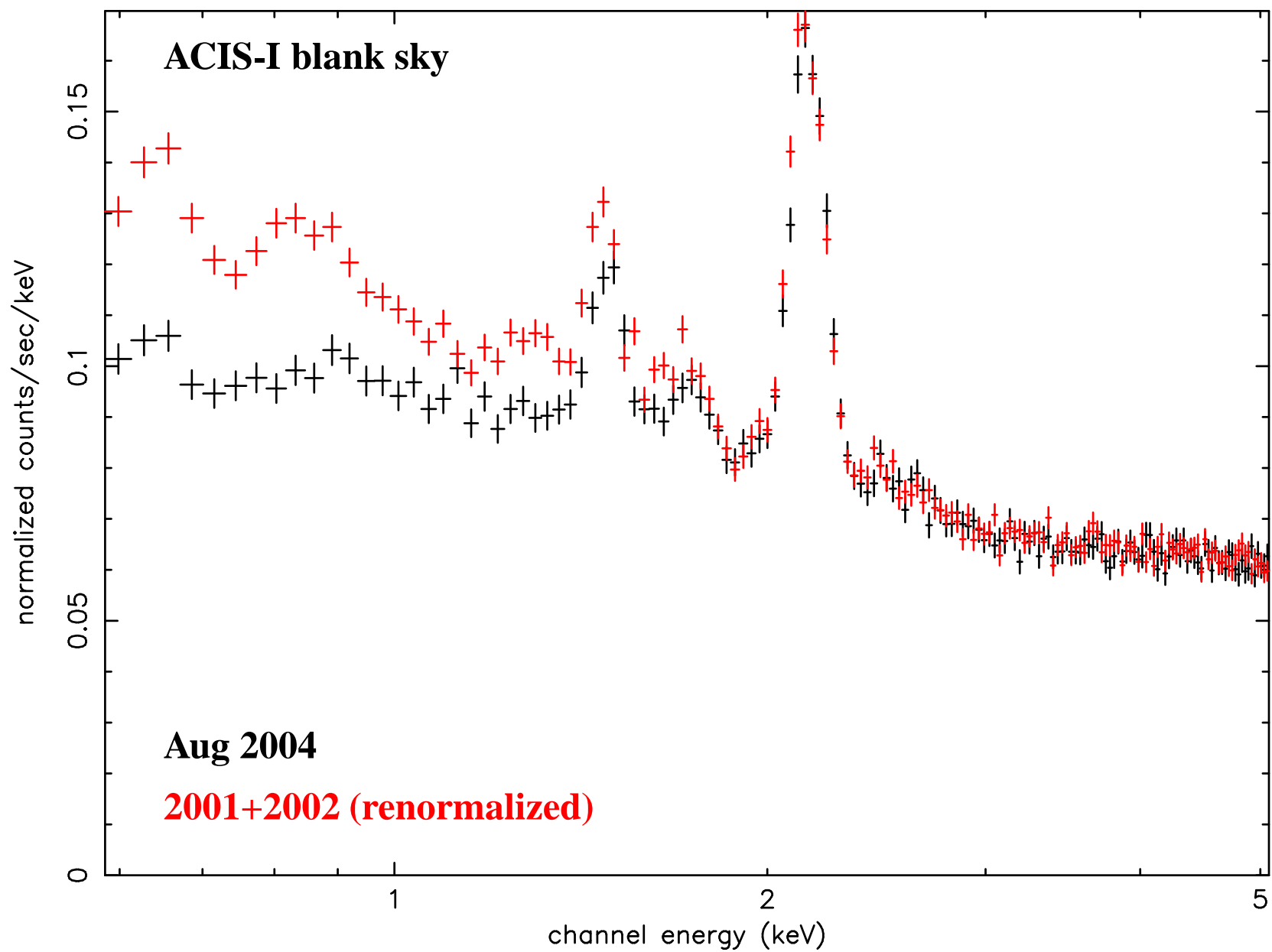
Particle background

ACIS stowed, works in full imaging mode, VFAINT

Date	OBSID	exposure, ks	
2002 Sep	62850	53	
2003 May	62848	48	
2003 Dec	62846	46	
2004 Nov	...	50	planned
2004 Dec	...	50	planned
total existing		144	

Combined dataset available from background web page (but not yet in CALDB)

Particle background: FI chips

Sep 2002
May 2003
Dec 2003
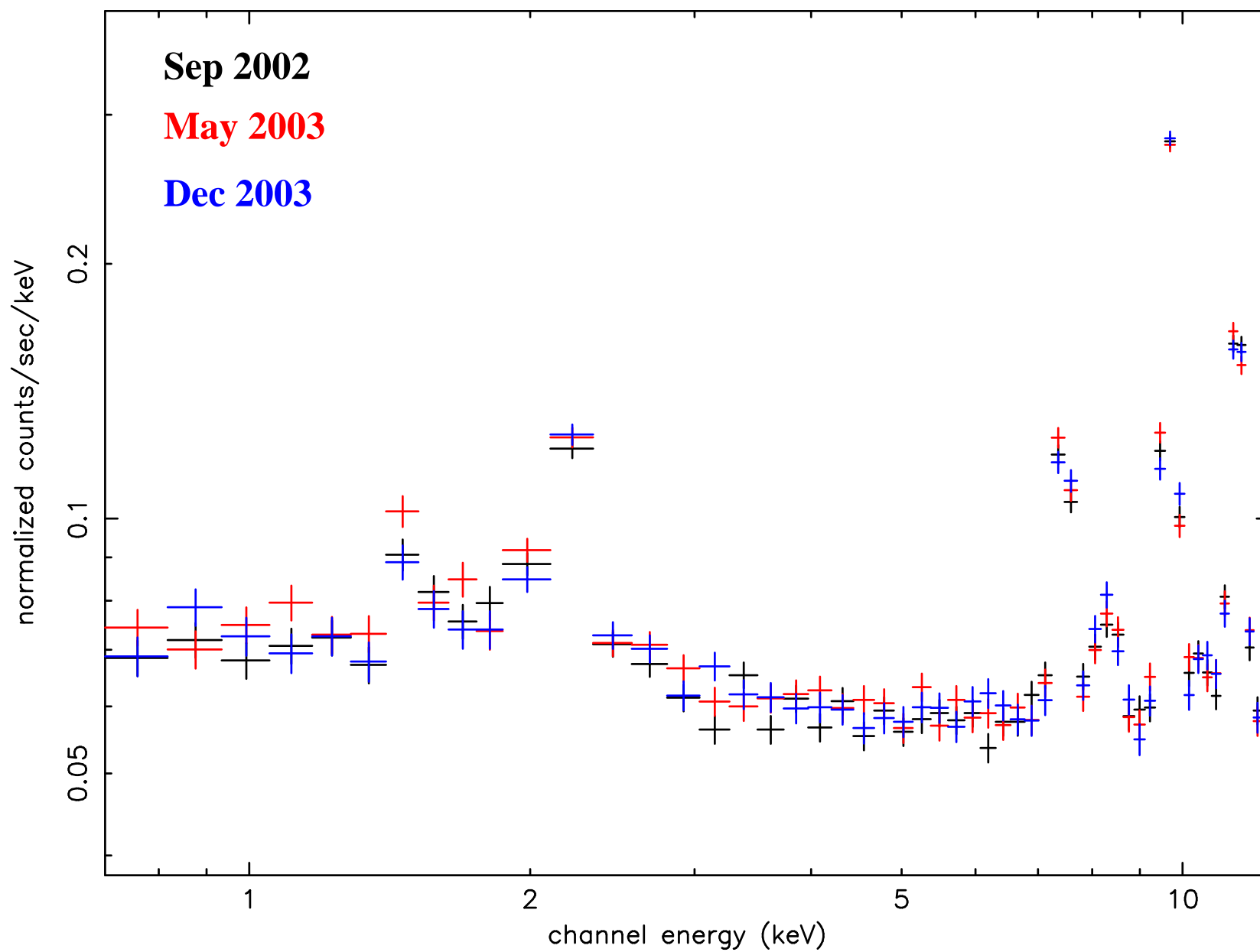
Particle background: S3 chip
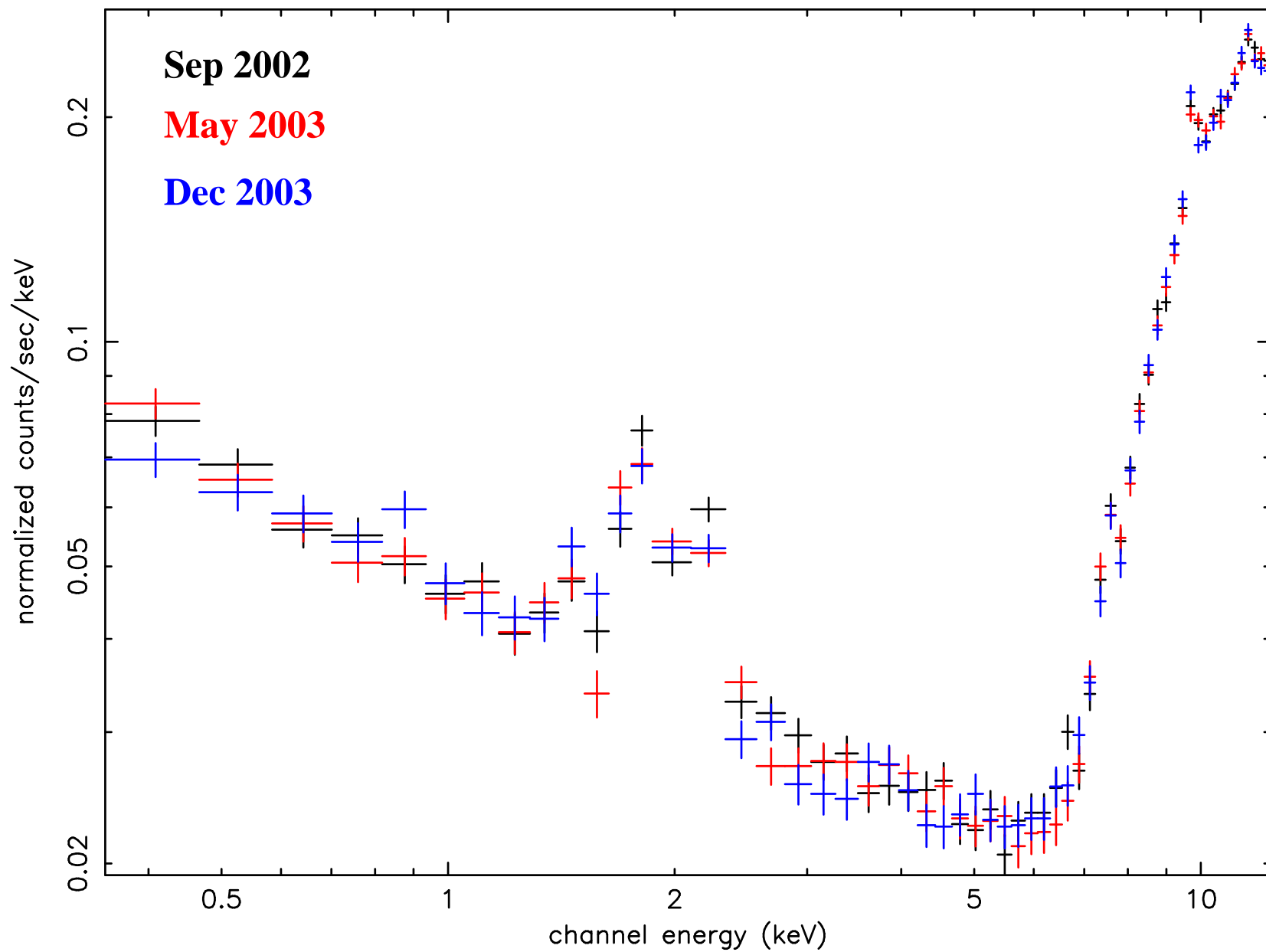
Flare frequency

When filtering light curves the same way as done for background files
(exclude ×1.2 above nominal rate in 2.5–7 keV band for BI, full band for FI):

- **BI chips: discard 35% of exposure**

- **FI chips: discard 6% of exposure**

(2001–2003)
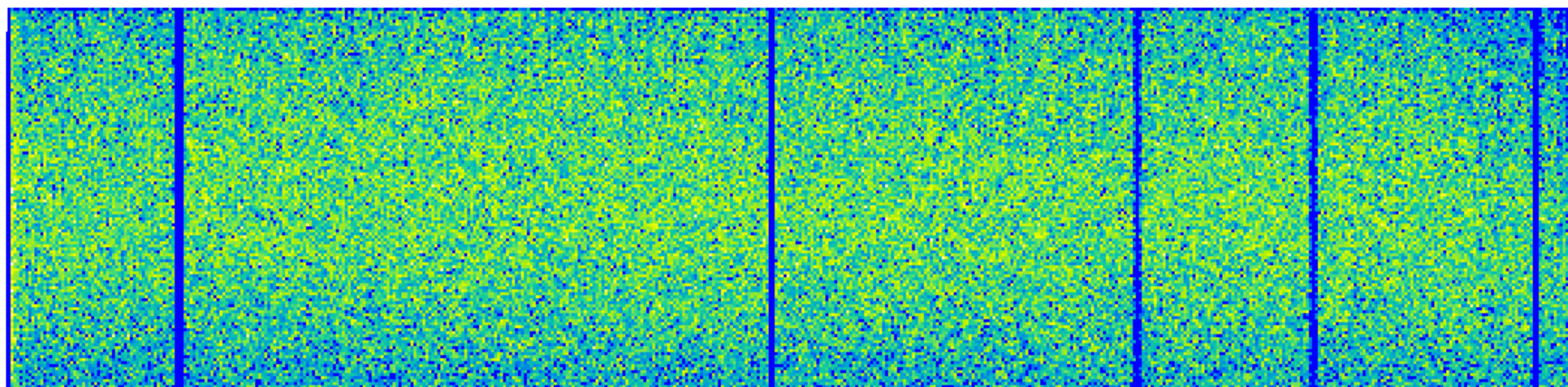
Time-variable Oxygen line

- **Dark Moon observations (Vargelin et al. 2004, ApJ)**

- **Cluster observations (Vikhlinin et al. in prep.)**

- **Also in *XMM* data (Nevalainen et al. 2004, subm.)**

Bad pixels

- **Ordinary bad pixels and columns very stable (a couple new per year)**

- **"Shadow" columns**

- **Vignetted CCD edges?**

Shadow columns

Cal. source 5.9 keV line, chip S2, y-axis binned by 8   (Vikhlinin)
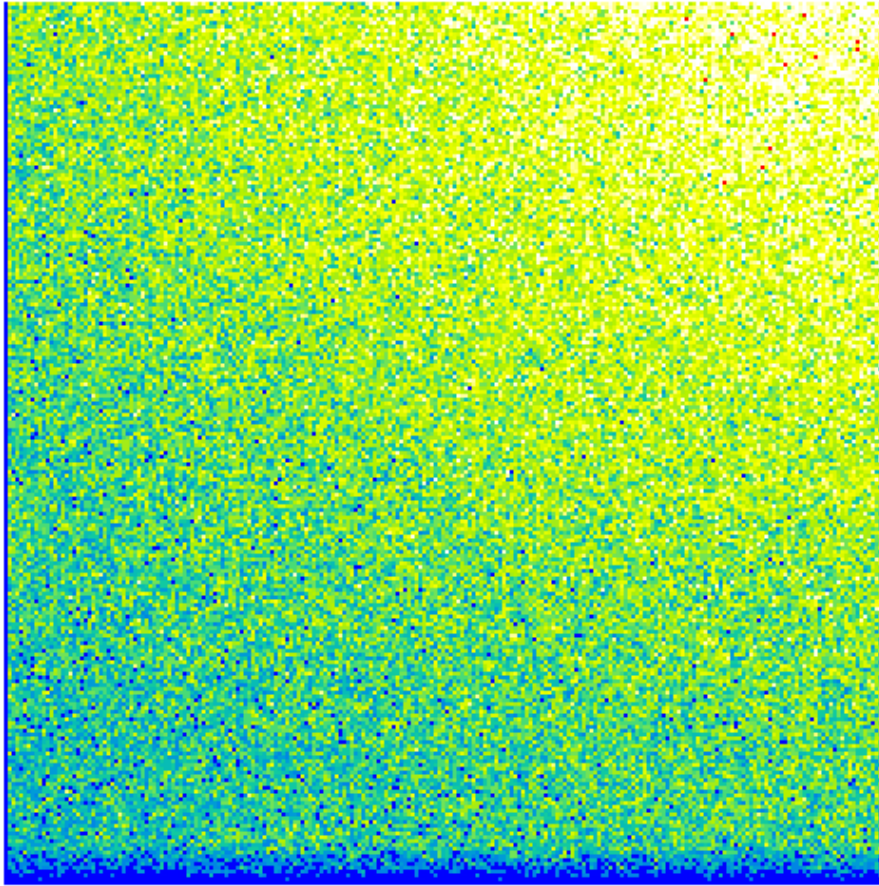

bad column · node boundary · shadow column · shadow column · node boundary
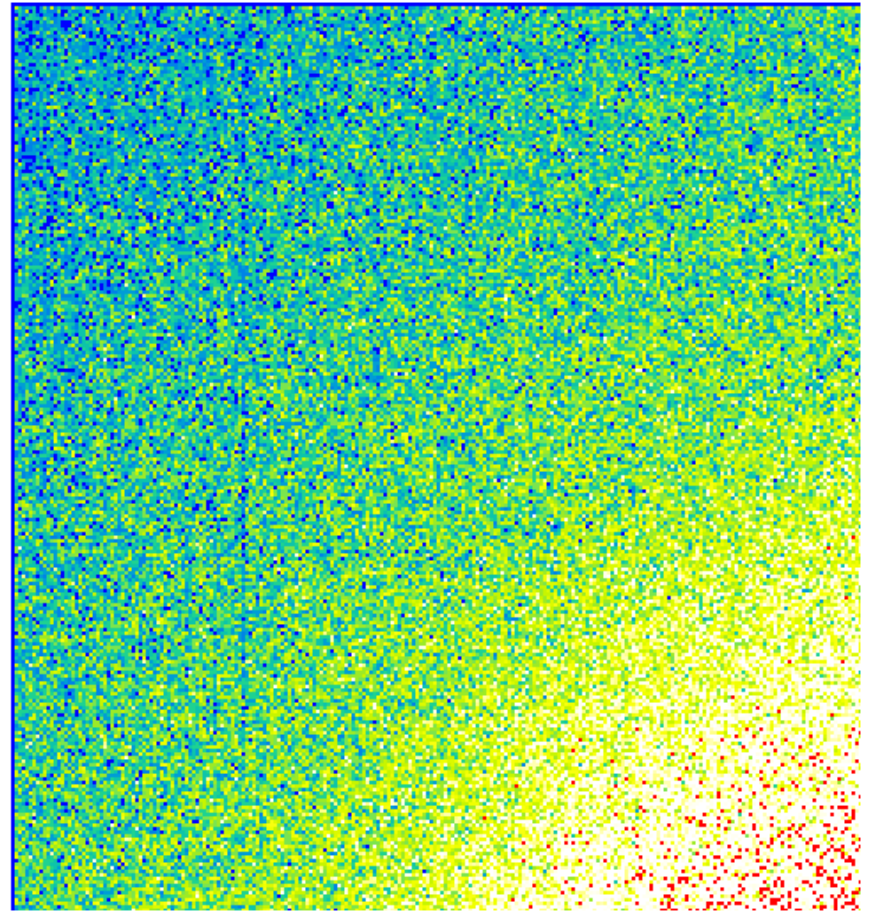
Will be included in the next version of bad pixel tables

Vignetted CCD edges?

CHIPY=1024 edge

CHIPY=0 edge

- **8–10 pixel shadows along CHIPY=0 edges of all chips (Vikhlinin)**

Summary

Background:

- **Rate started to increase in 2004**

- **Spectrum stays constant to a few % accuracy**

- **Time-variable OVII line from the sky**

- **Have 140 ks particle background (ACIS-stowed), will soon have another 100 ks**

Bad pixels:

- **Ordinary bad pixels and columns stable (a couple new per year)**

- **Shadow columns, to be included in bad pixel table**

- **Vignetted CCD edges — may be included in bad pixel table**

1E 0657−56   0.5 Msec