

Prospects for a Broad-Band Effective Area Standard Candle

Steve Sembay
EPIC-MOS Calibration Manager



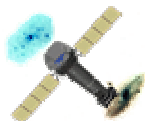
XMM
EPIC
MOS

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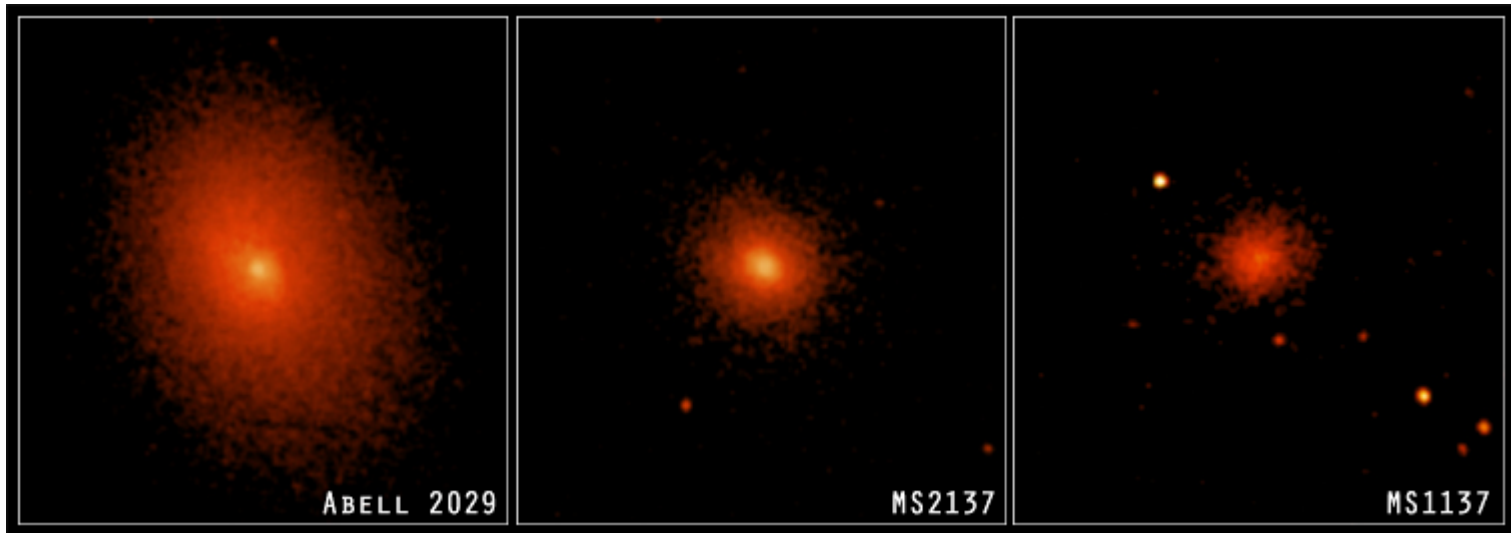


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	Compact	Stable	Simple	Broad-Band
MS2137				
Crab				
G21.5				
Vela PWNe				



Some Clusters Observed by Chandra



All Chandra Images/Movies courtesy of...
<http://chandra.harvard.edu/photo/index.html>



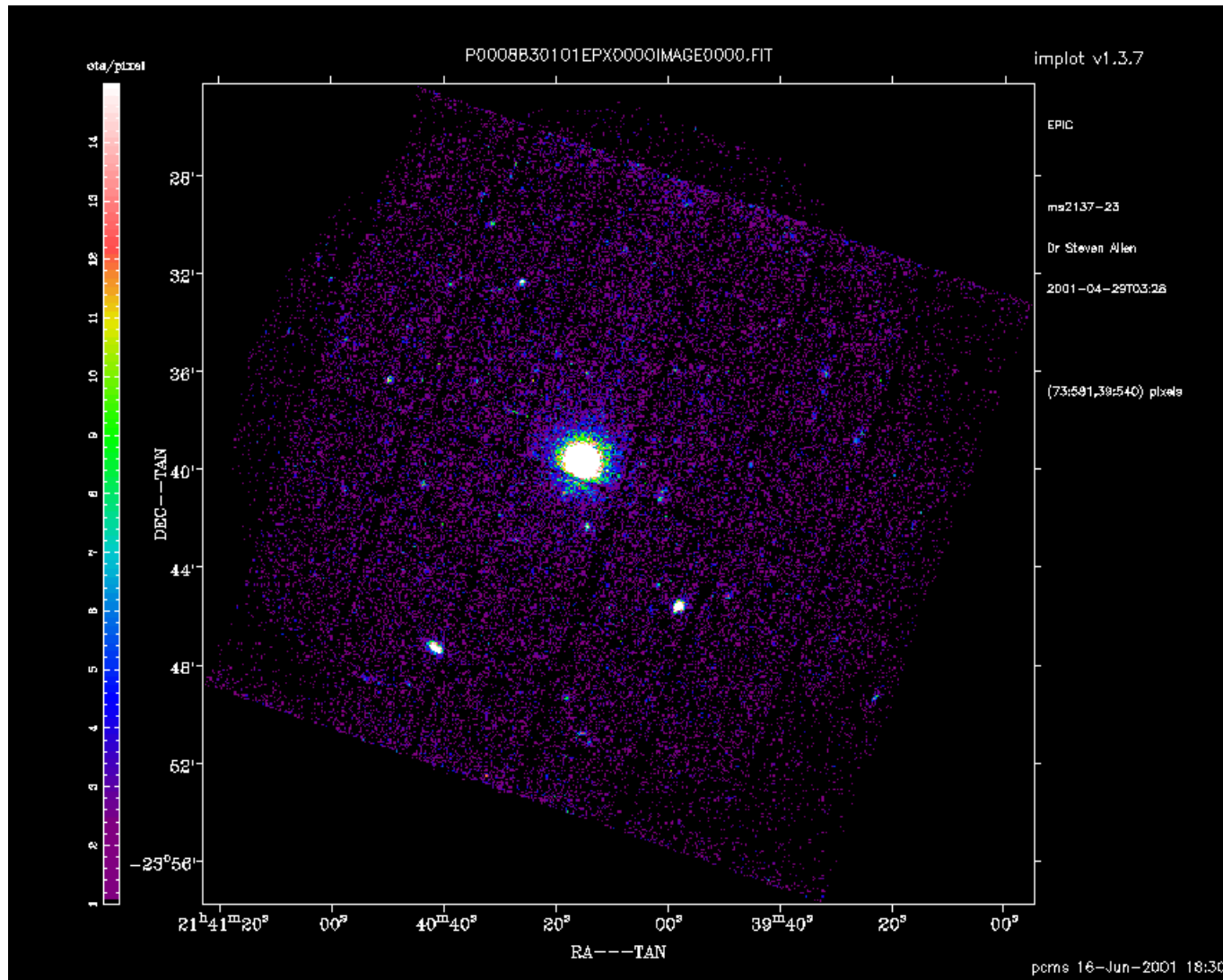
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XMM-EPIC observation of MS 2137



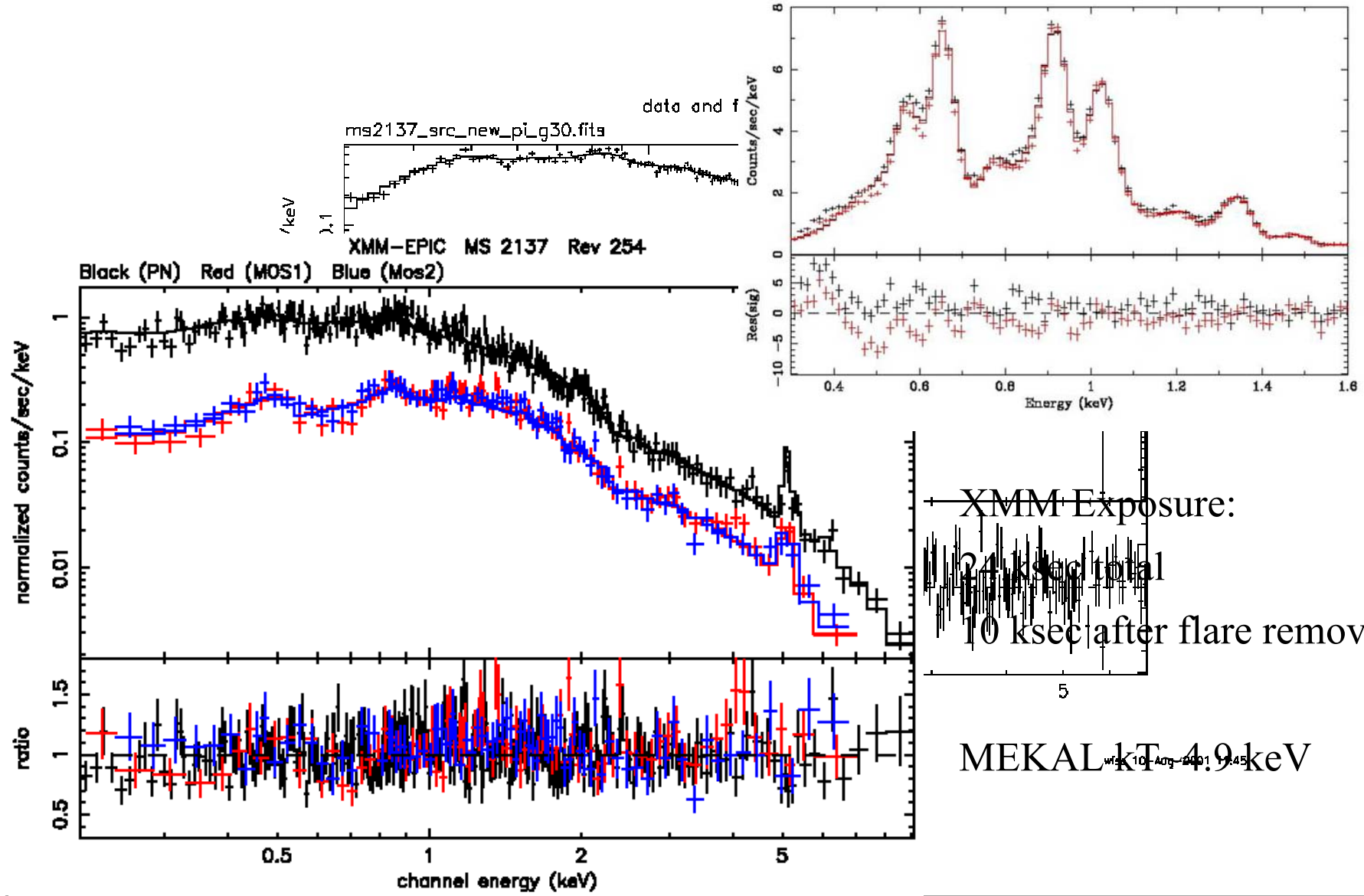
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OBSID 0135722401: E0102, MOS1 & MOS2, linelist model, Red Chi = 5.8
 DOP=215, kT=0.743 keV, Thick Filter, Large Window



XMM Exposure:
 24 ksec total
 10 ksec after flare removal

MEKAL kT 4.9 keV

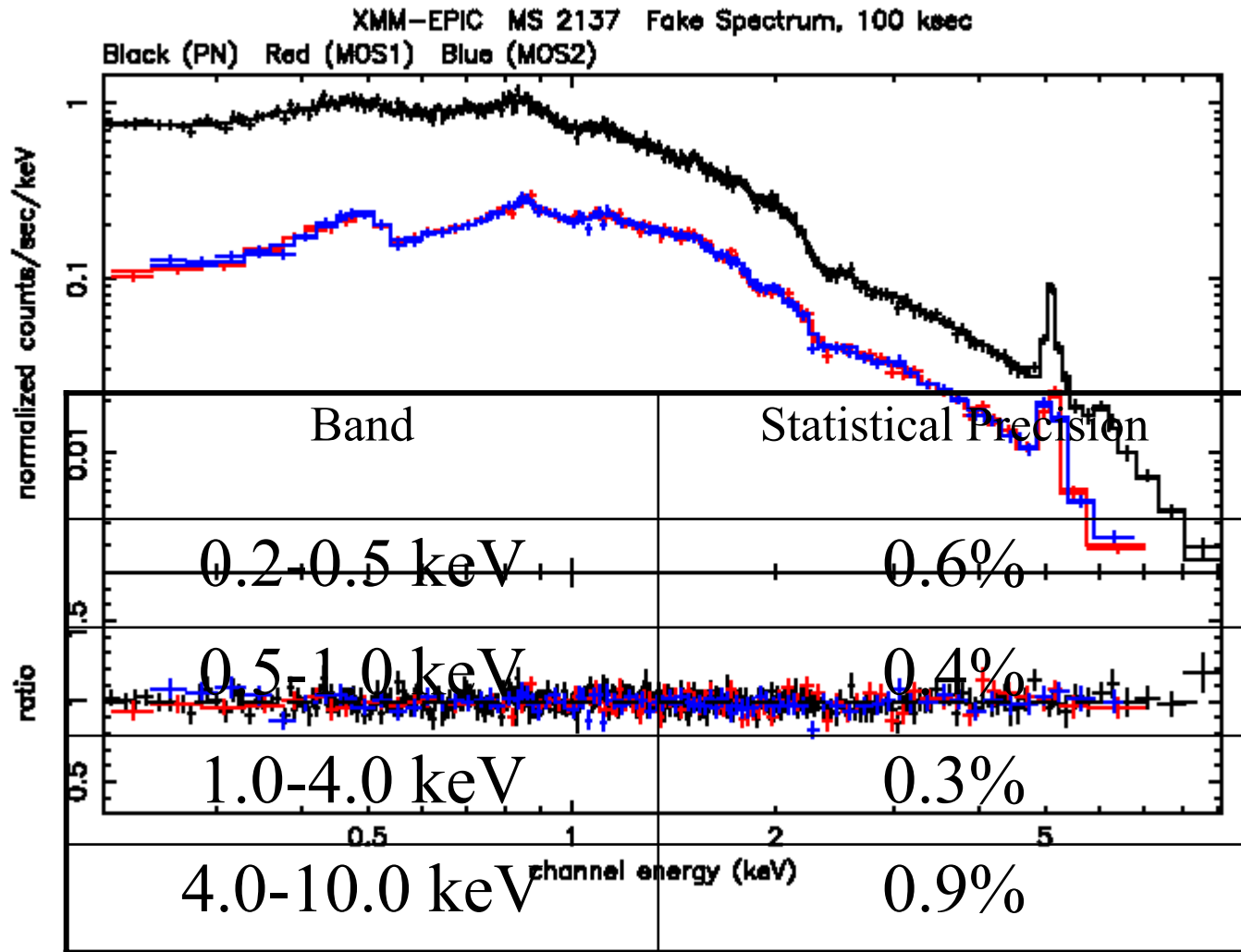


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“Legacy Observation”: 100 ksec XMM observation



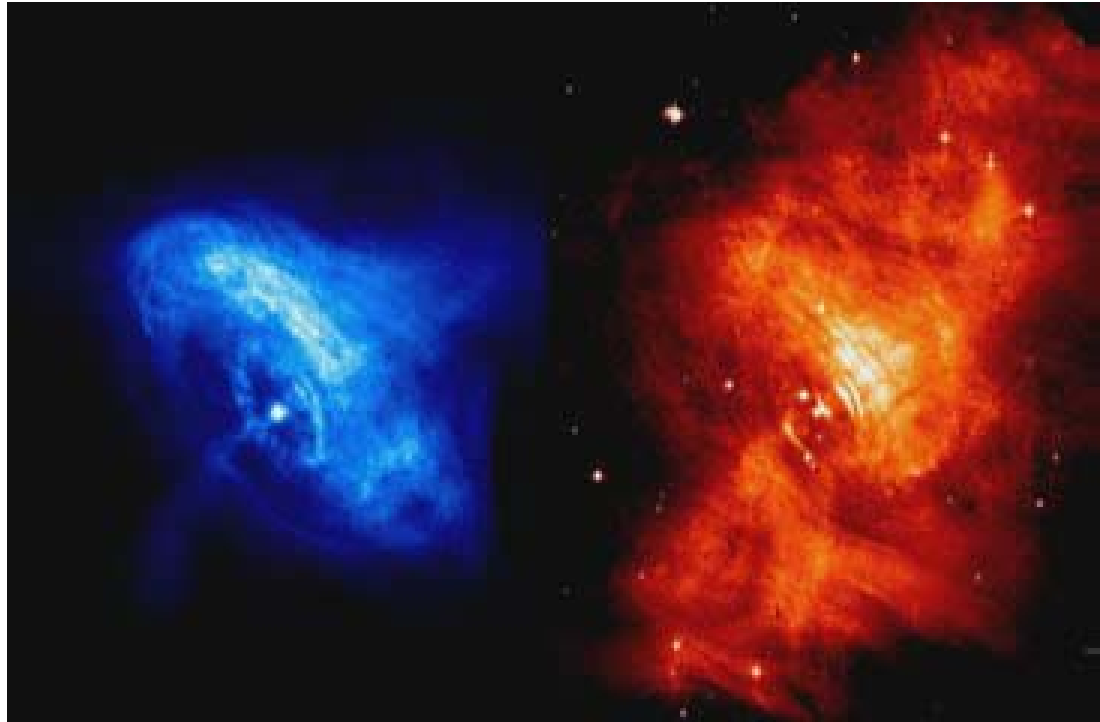
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“Our Standard Candle” - The Crab



Chandra

HST



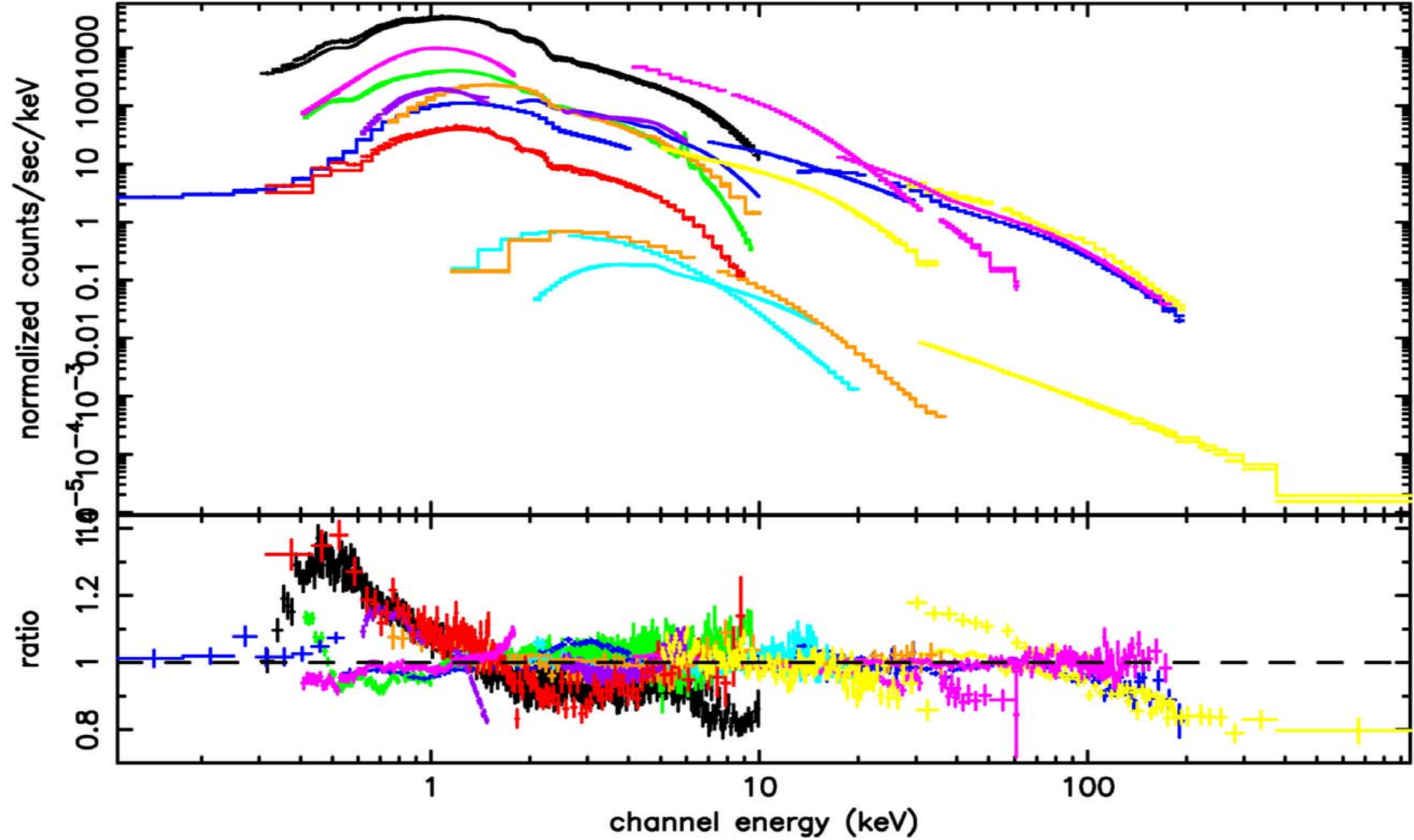
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black: pn, red: MOS, green: Swift, blue: Sax, lblue: EXOSAT, yellow: INTEGRAL
pink: RXTE+ ROSAT, brown: ASCA + Ginga, purple: Chandra



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MOS

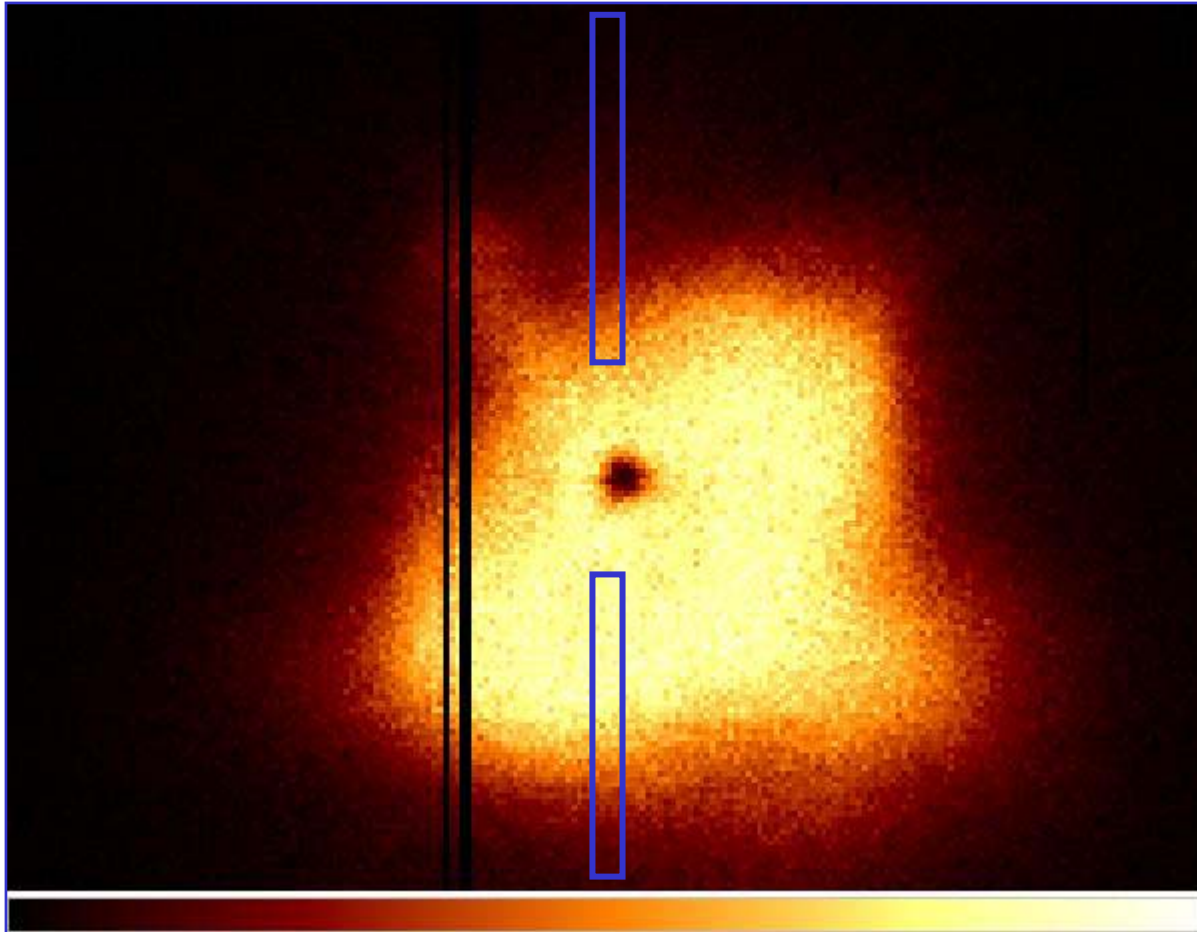
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EPIC-MOS2 Raw Image in Detector Coordinates

Special Imaging Mode with only 6% duty cycle



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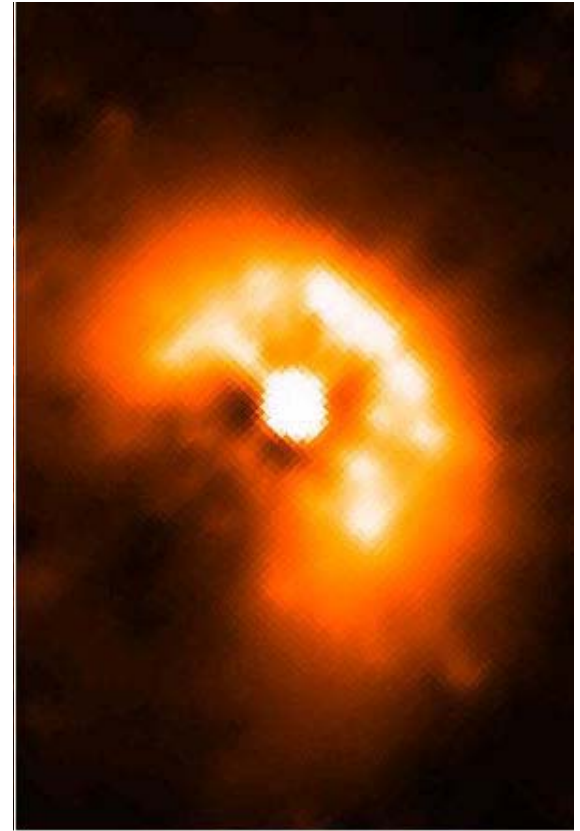
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Chandra

Vela PWNe



EPIC-MOS
Deconvolved

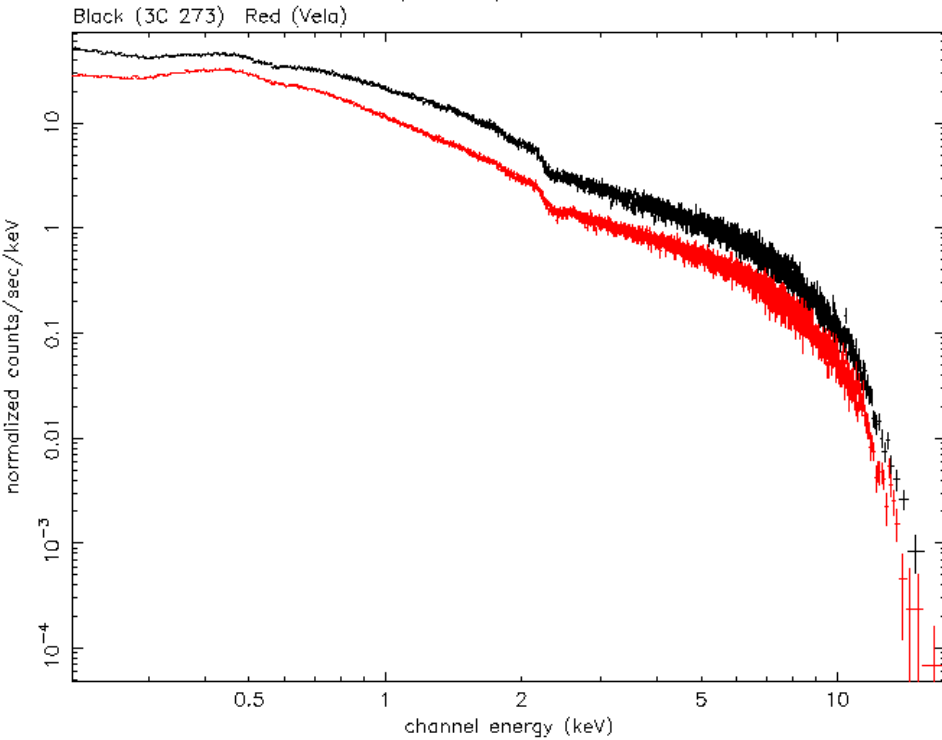


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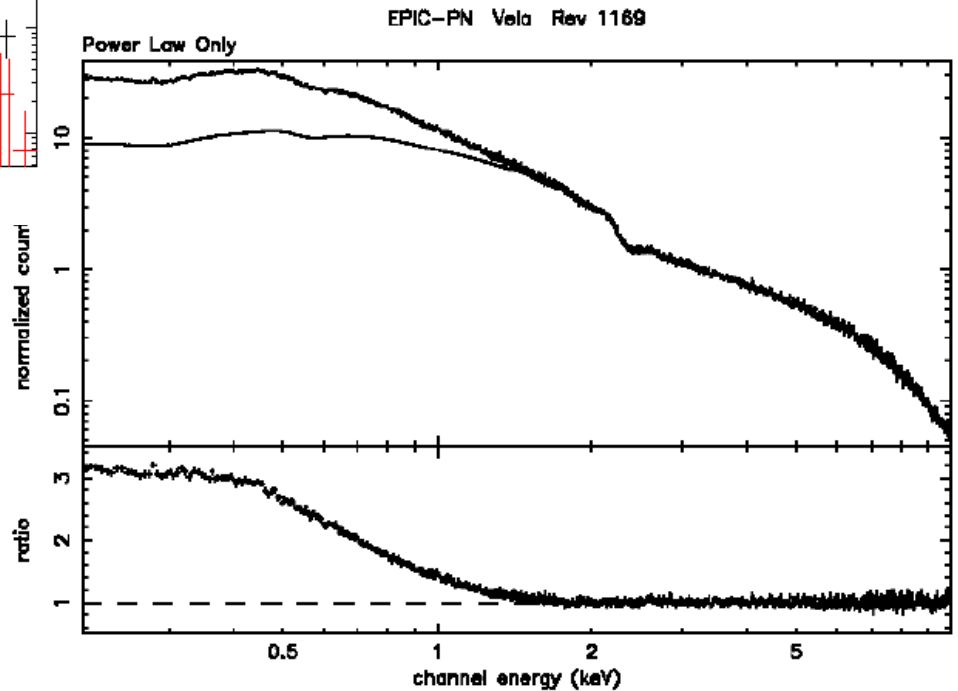


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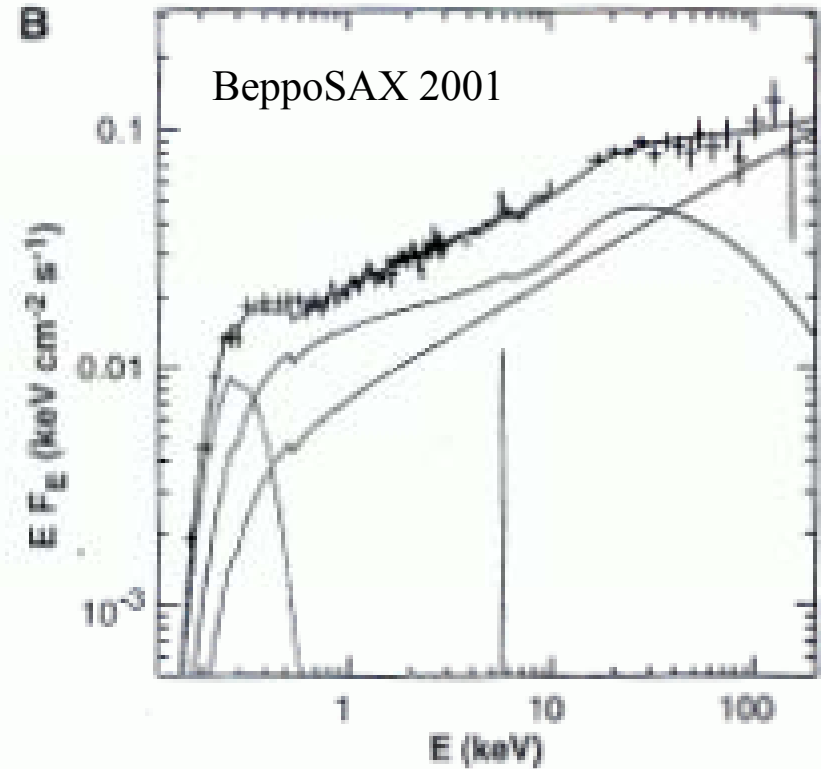
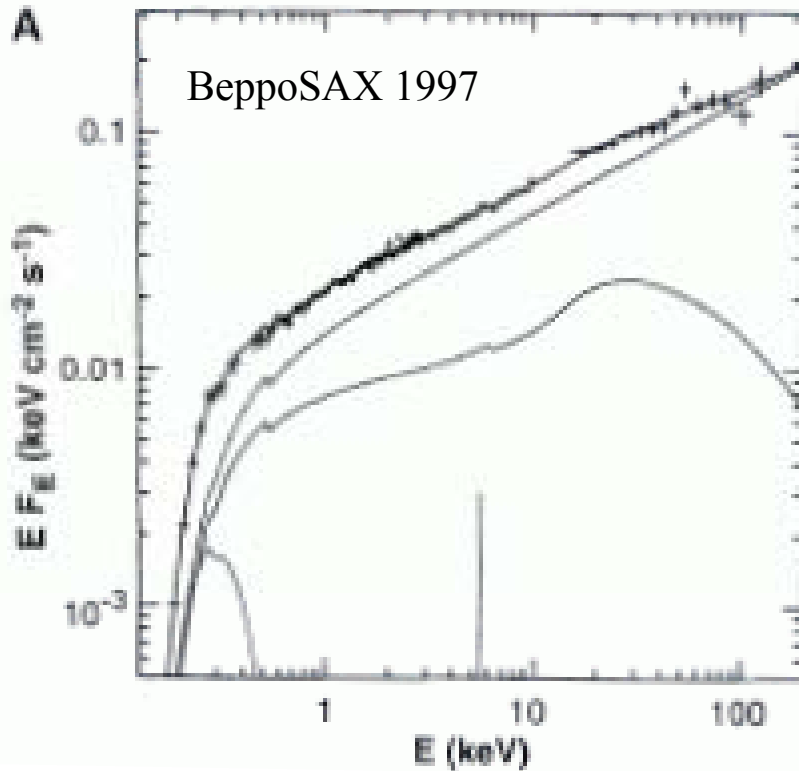


Only ~2 factor weaker than
3C 273 (both 40" extrac. radius)

Ave. PL, $\Gamma \sim 1.55$, harder than
3C 273 (1.65-1.80)
with Soft Component



Is 3C 273 a simple power-law at high energies?



Grandi, P. and Palumbo, G.G.C., 2004, *Science*, **306**, 998

Analysed 6(9) BeppoSAX observations between 1997 and 2001

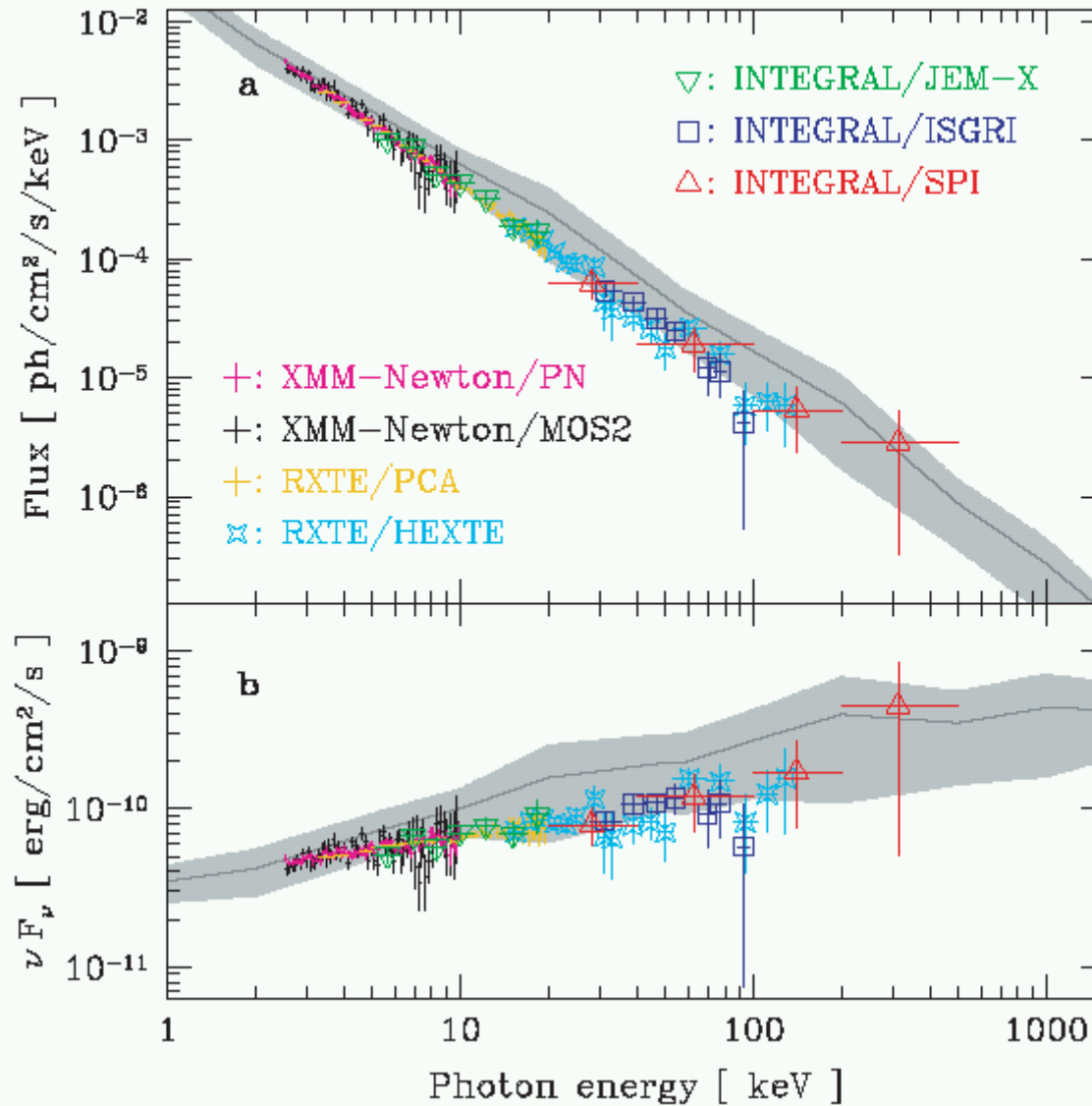


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XMM Obs.
In Orbit 563



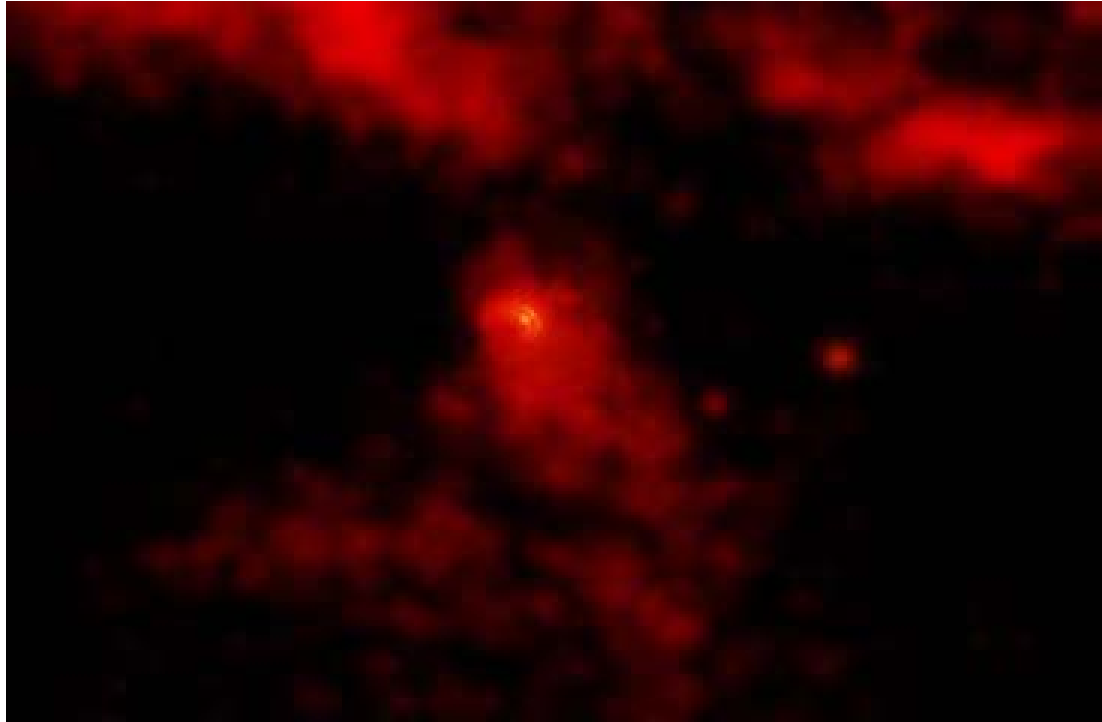
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Variability of Vela PWNe - Chandra



Observations over 2.5 Years



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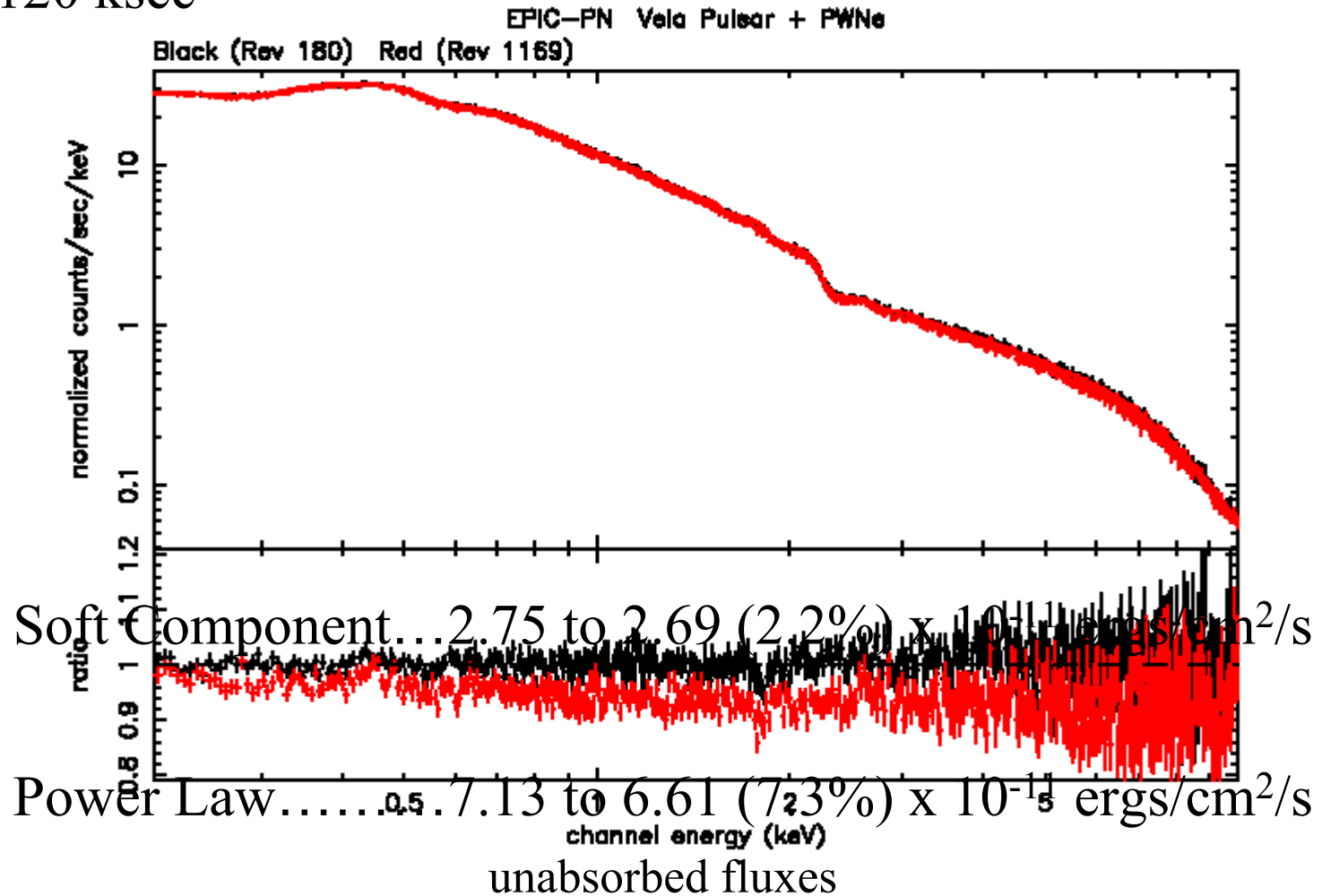


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0180: 80 ksec

1169: 120 ksec

Variability of Vela PWNe – XMM-PN

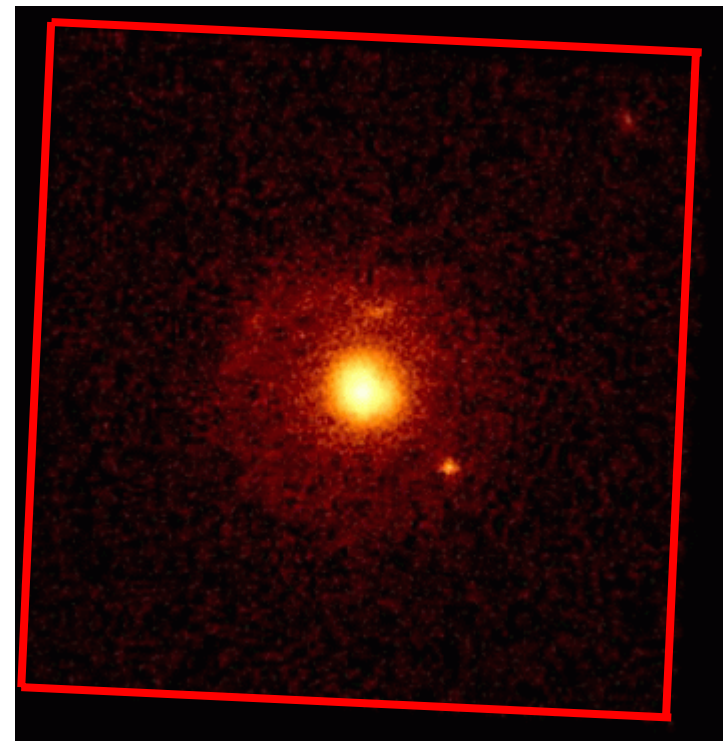
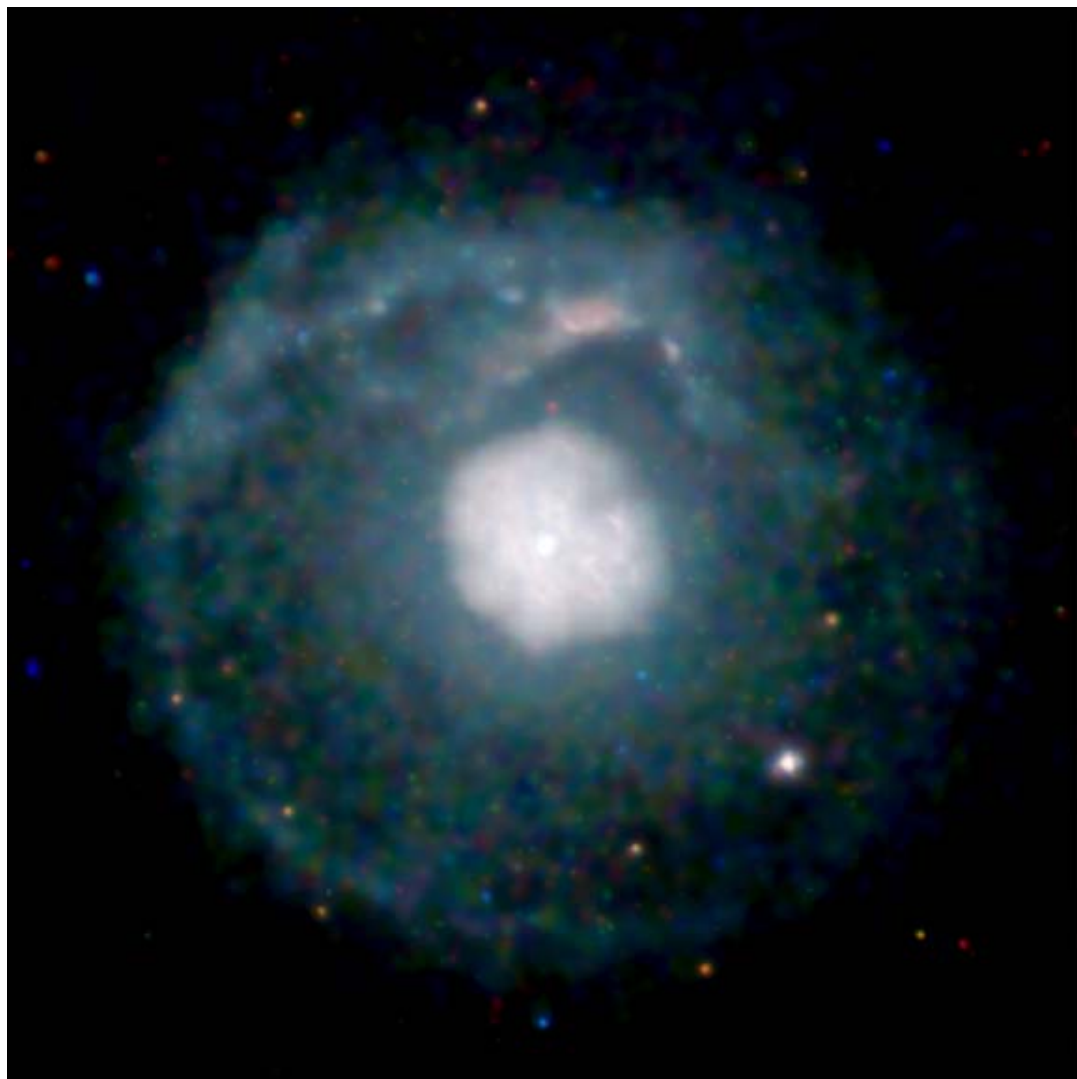


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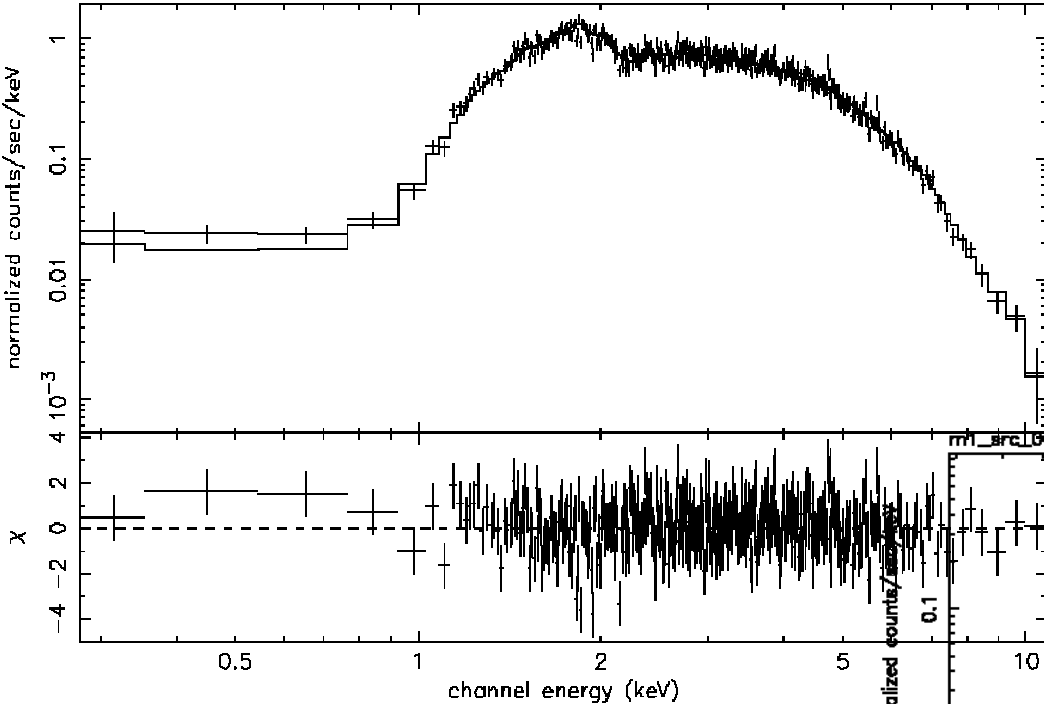
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G21.5

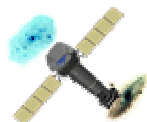
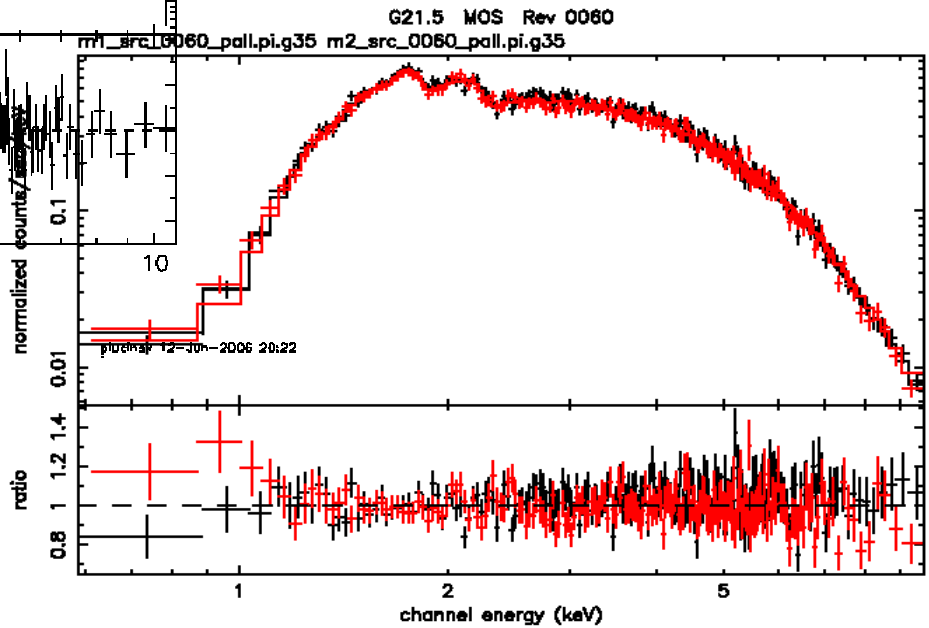
OBSID 1554: G21.5-0.9 on S3, phabs(pow), NH=2.1e22 cm⁻²,
index=1.73, RedChi=1.08, DOF=386, CIAO 3.3, CALDB 3.2.1

obs1554_cir_pha_ciao3.3_src1_grp.pha



Chandra

EPIC-MOS 1/2



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Prospects for a Broad-Band Effective Area Standard Candle

	Compact	Stable	Simple	Broad-Band
MS2137	Yes	Yes	No	No
Crab	Yes	Almost	Yes/No	No
G21.5	Yes	??	Yes	No
Vela PWNe	Yes	No	Yes	Yes



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