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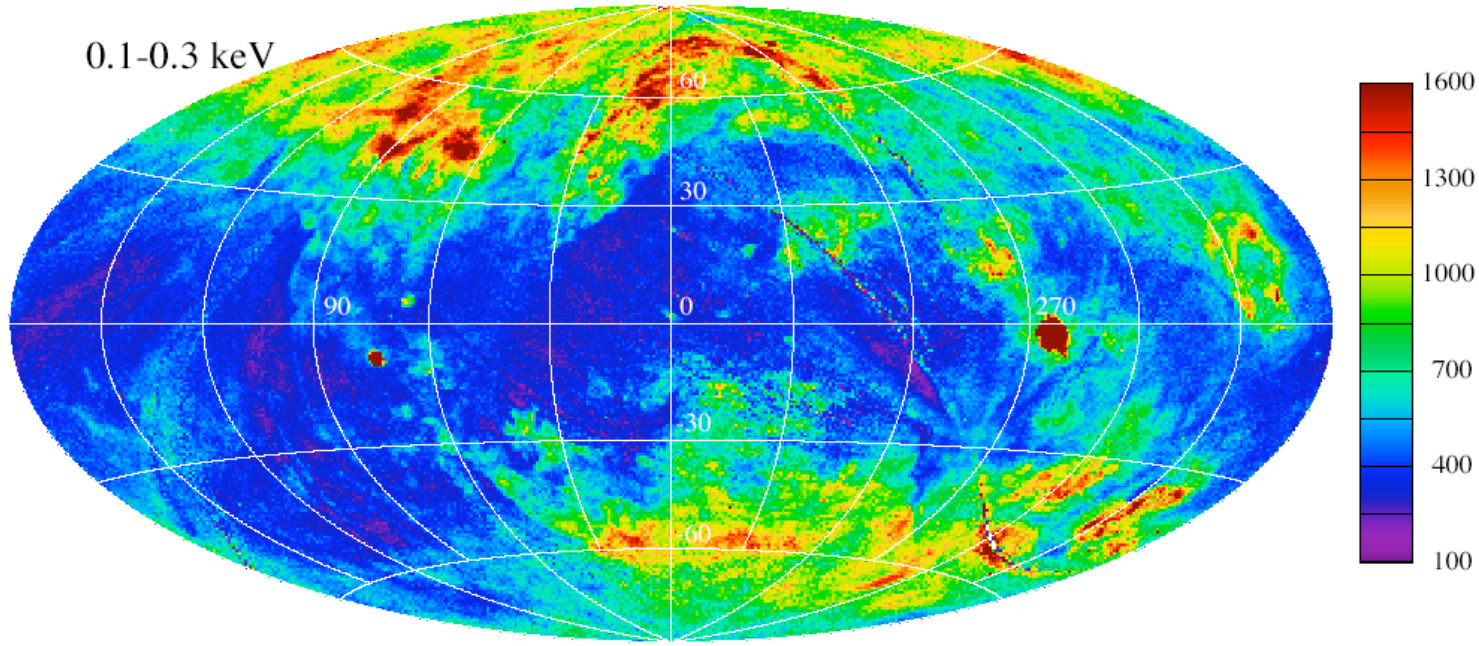
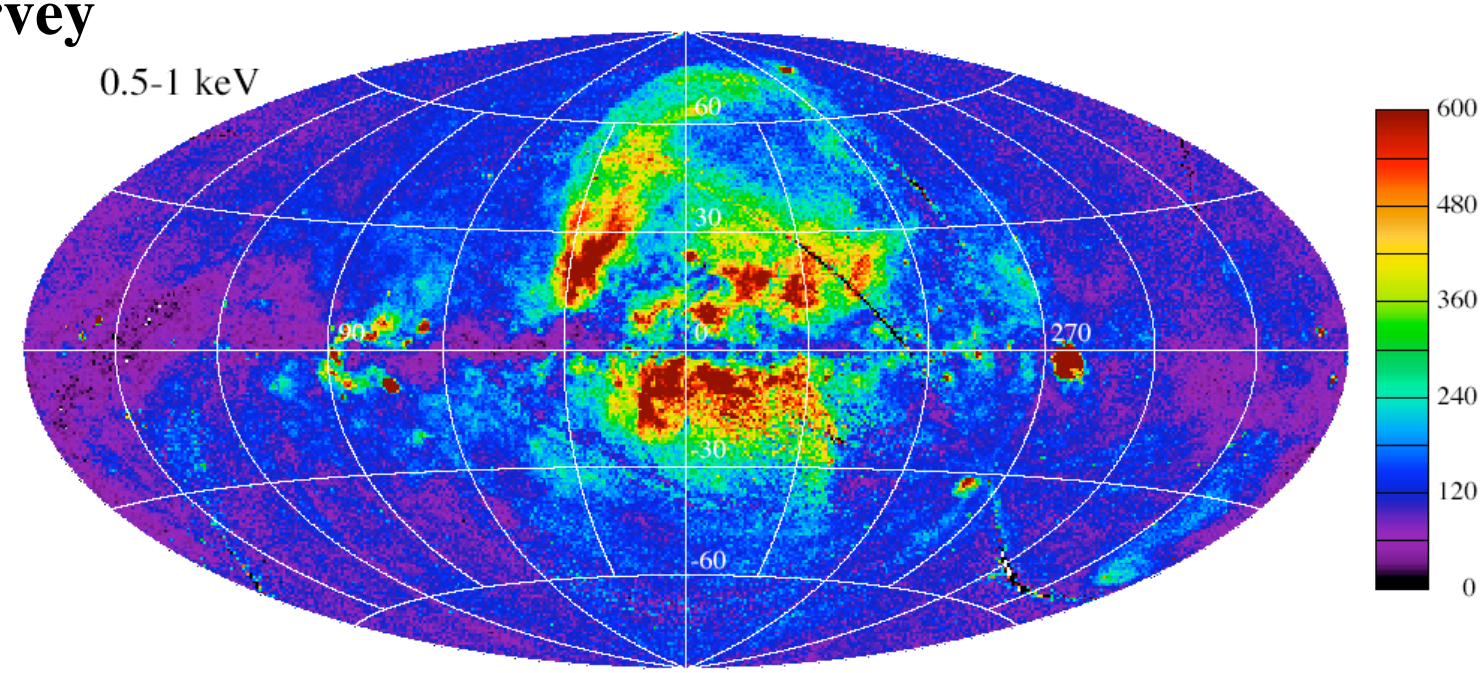
Dan McCammon

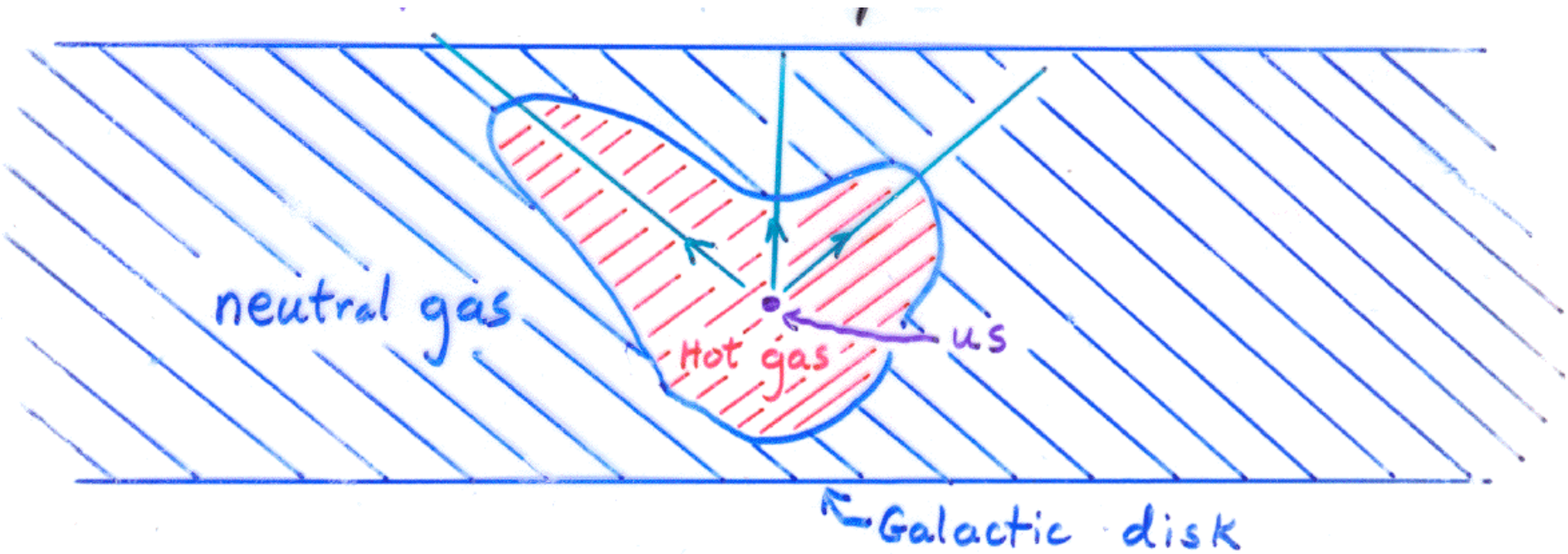
University of Wisconsin — Madison

ROSAT All-Sky Survey

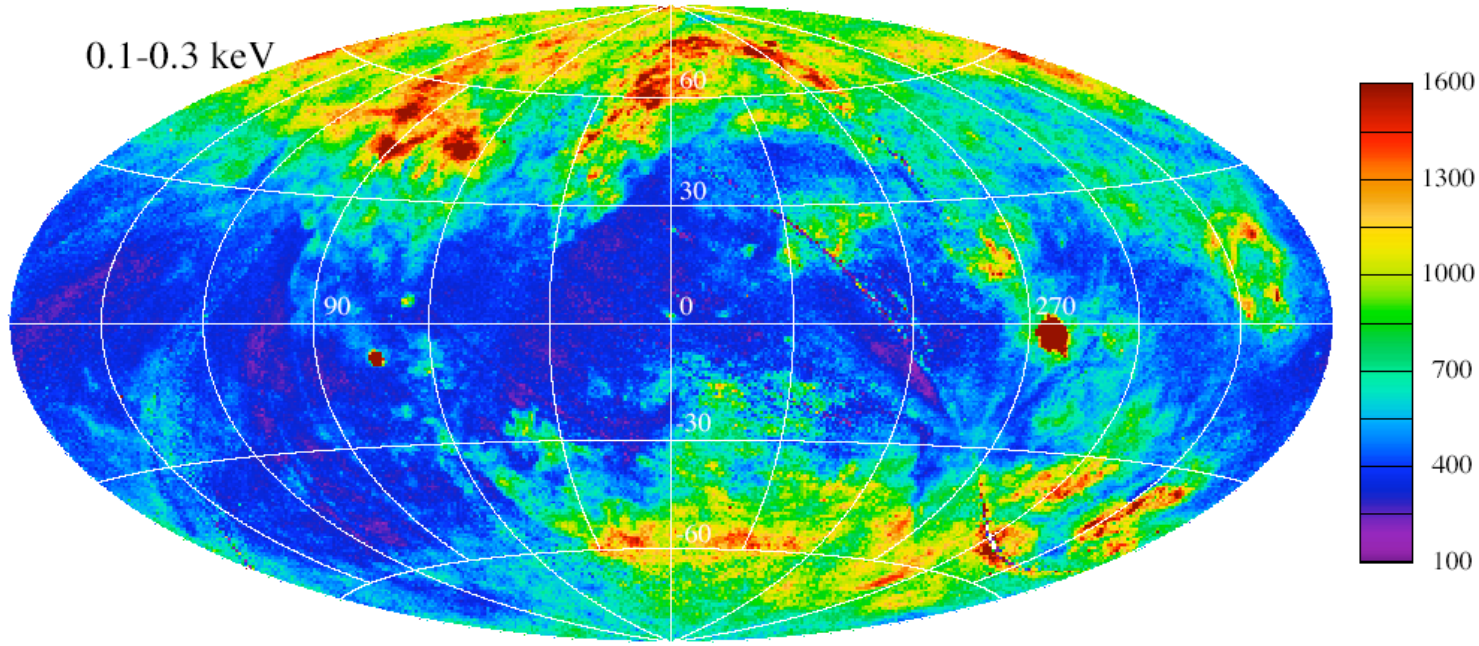


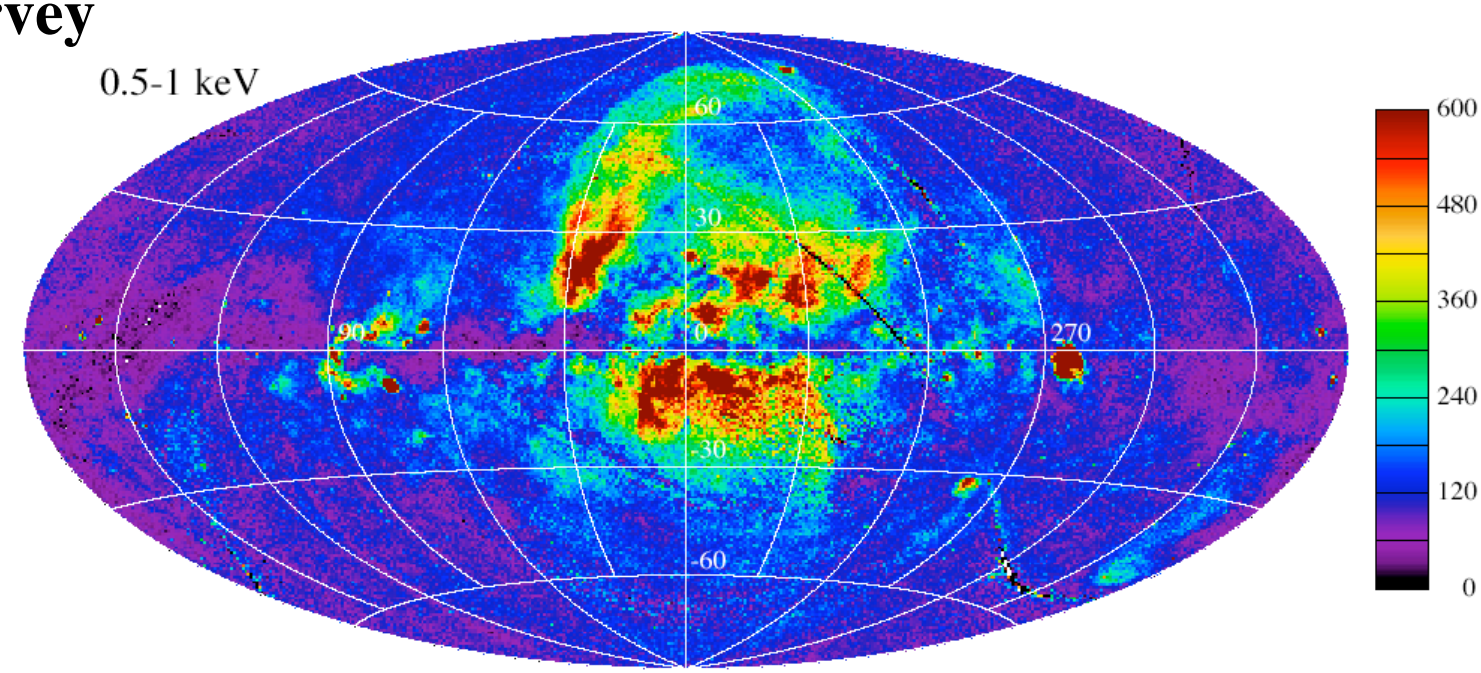


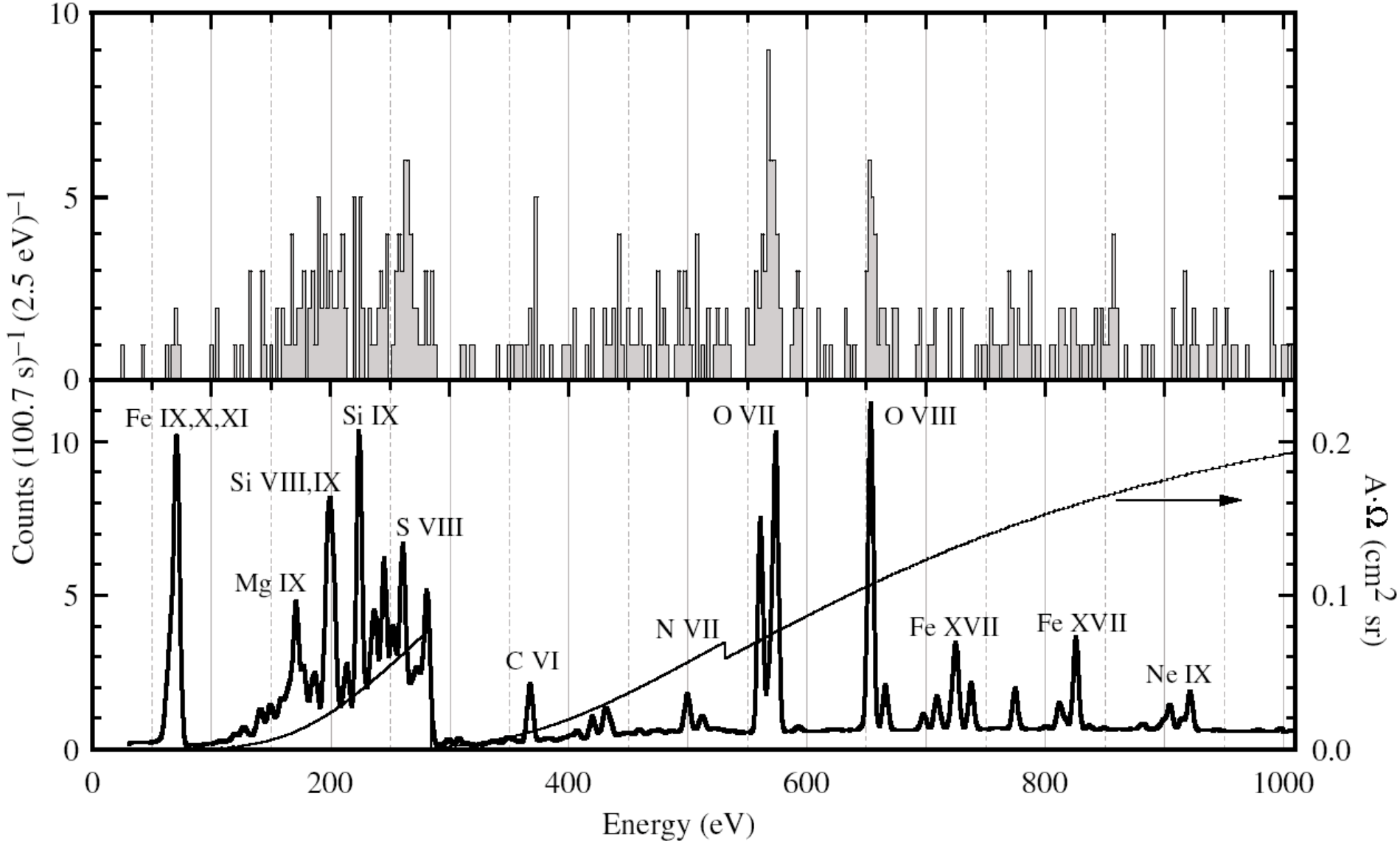
“Displacement”

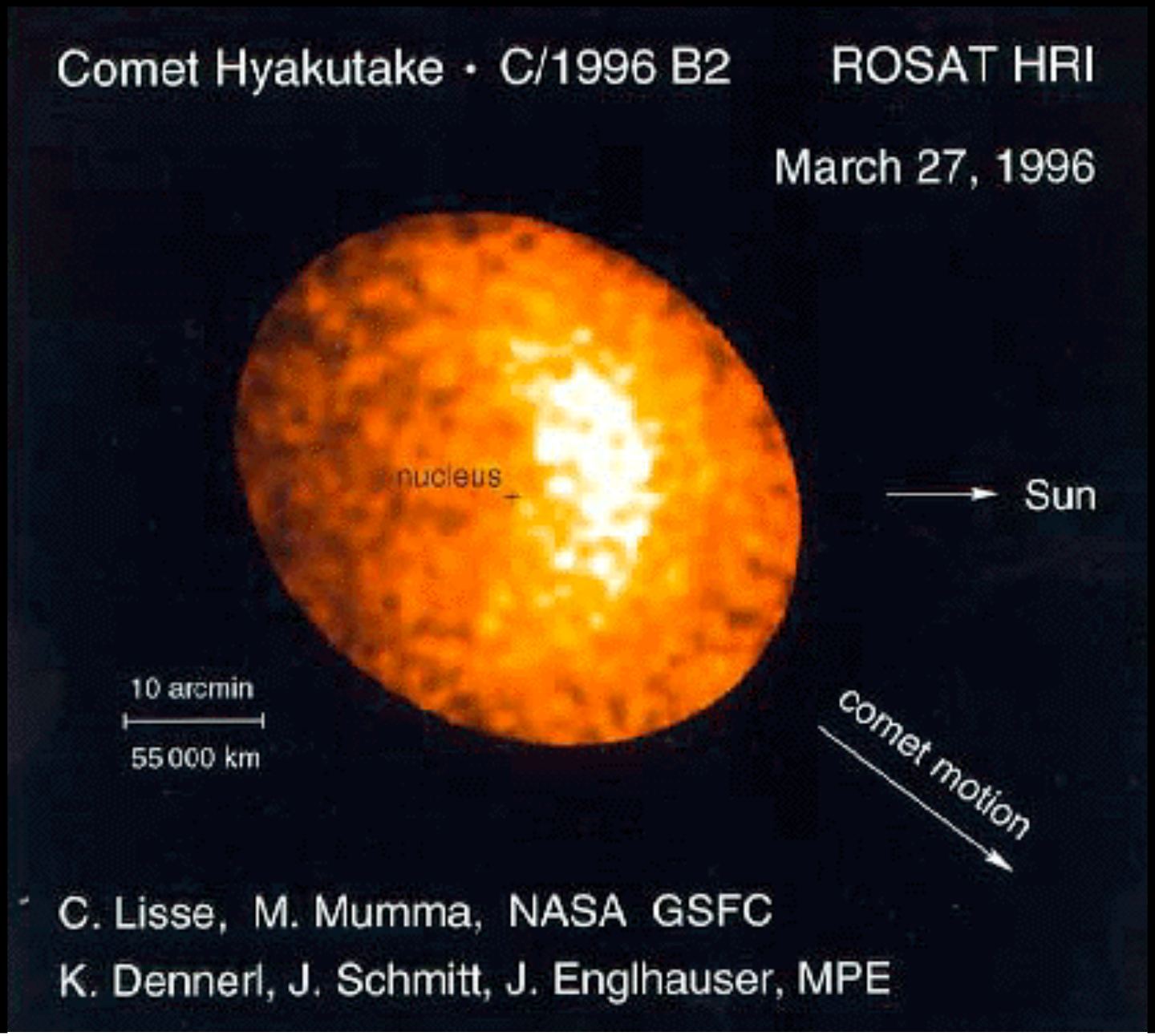


ROSAT All-Sky Survey

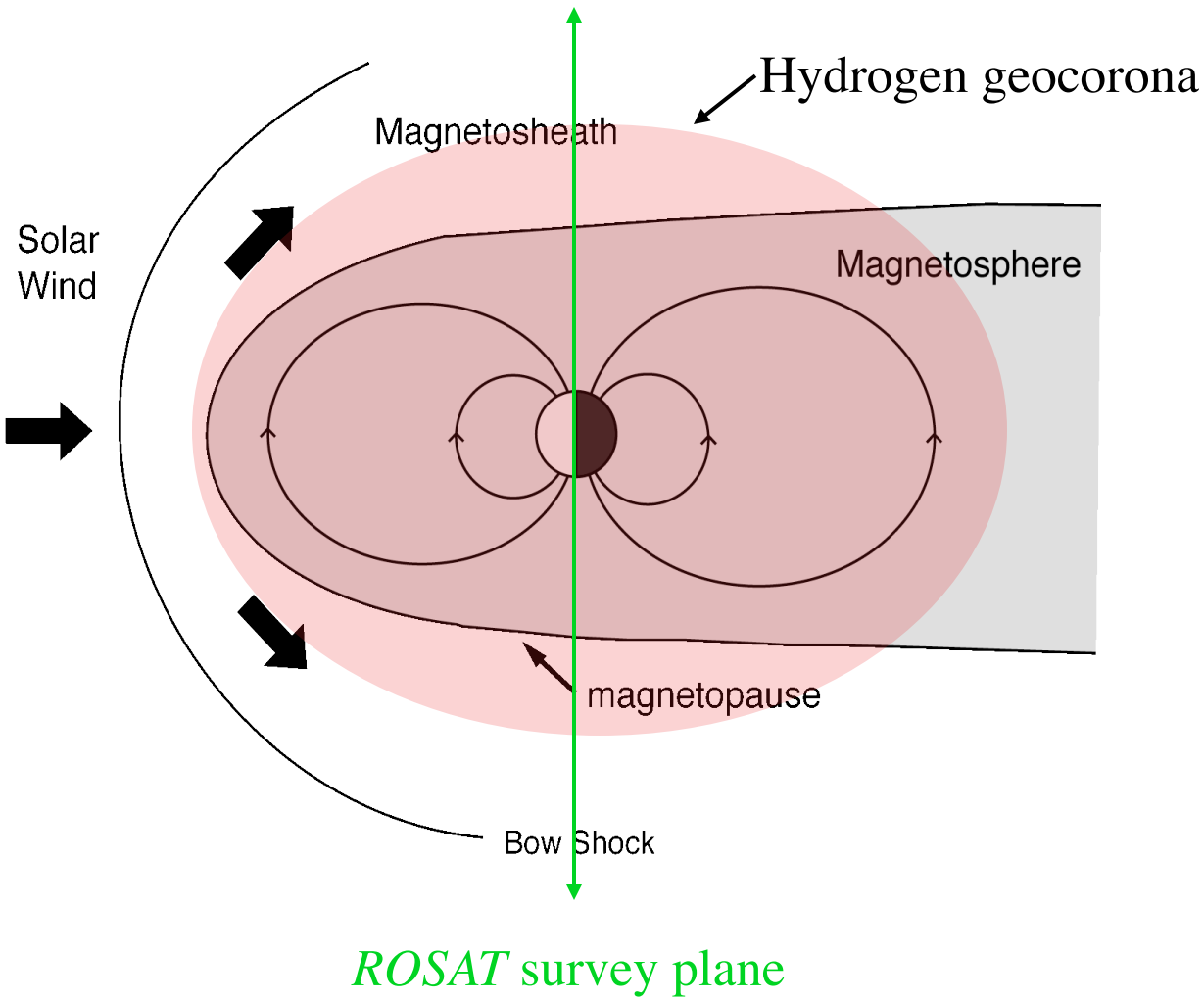


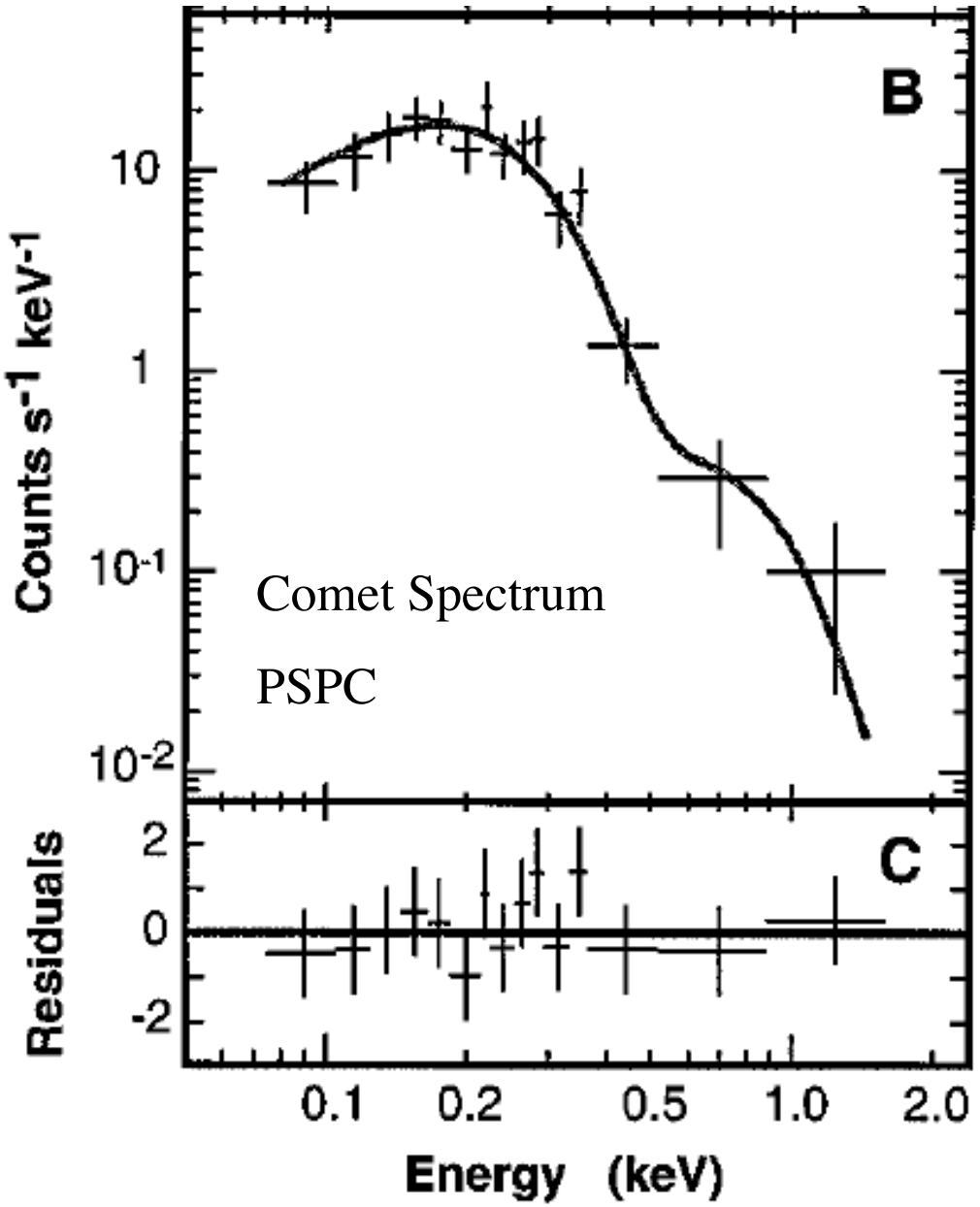



Counts (100.7 s)$^{-1}$ (2.5 eV)$^{-1}$
A·Ω (cm^2 sr)
Energy (eV)
Fe IX,X,XI
Si VIII,IX
Mg IX
Si IX
S VIII
C VI
N VII
O VII
O VIII
Fe XVII
Fe XVII
Ne IX
0
5
10
0
200
400
600
800
1000
0.0
0.1
0.2


Comet Hyakutake • C/1996 B2
ROSAT HRI
March 27, 1996
nucleus
Sun
10 arcmin
55 000 km
comet motion
C. Lisse, M. Mumma, NASA GSFC
K. Dennerl, J. Schmitt, J. Englhauser, MPE

Magnetosphere

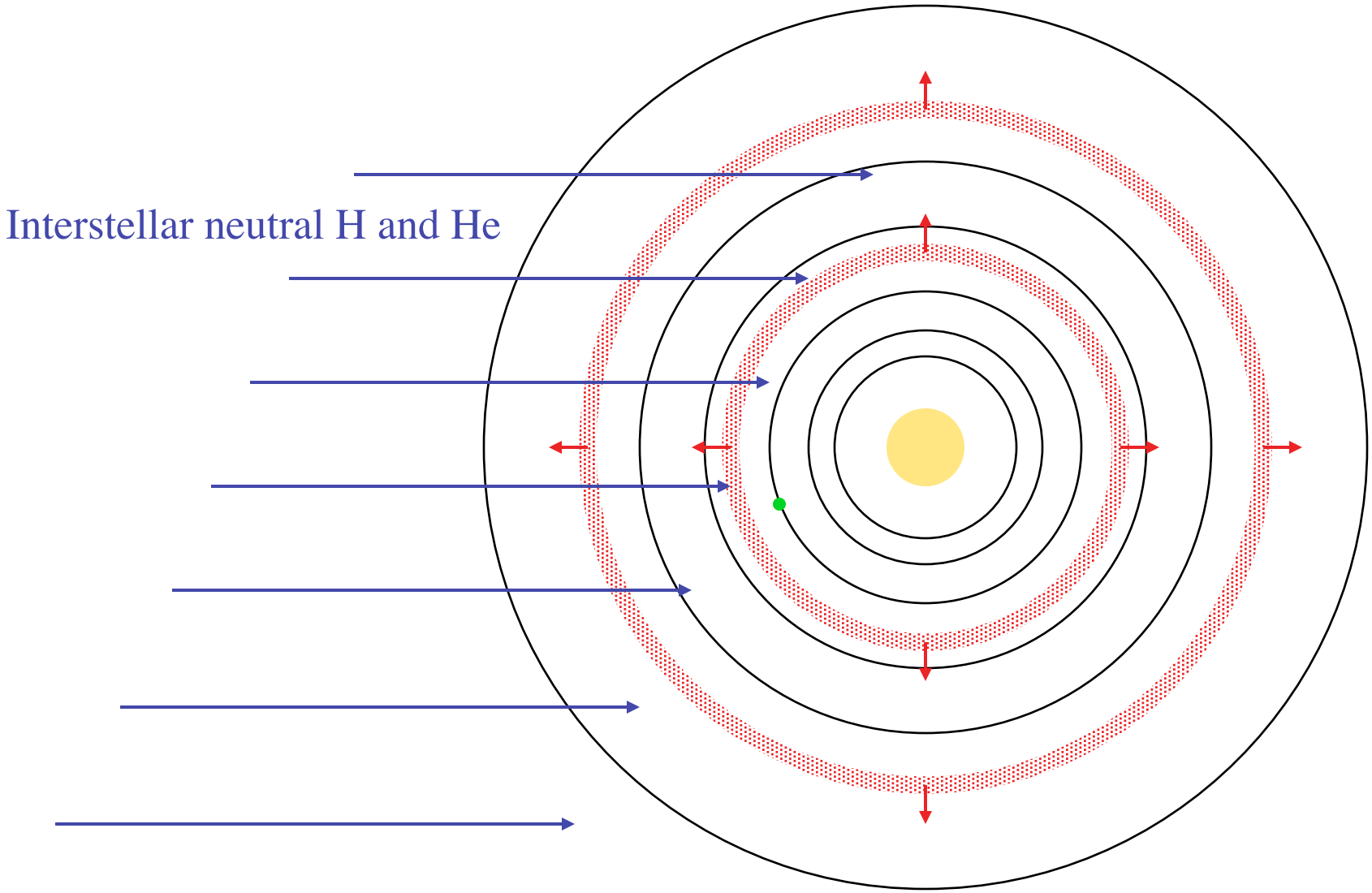




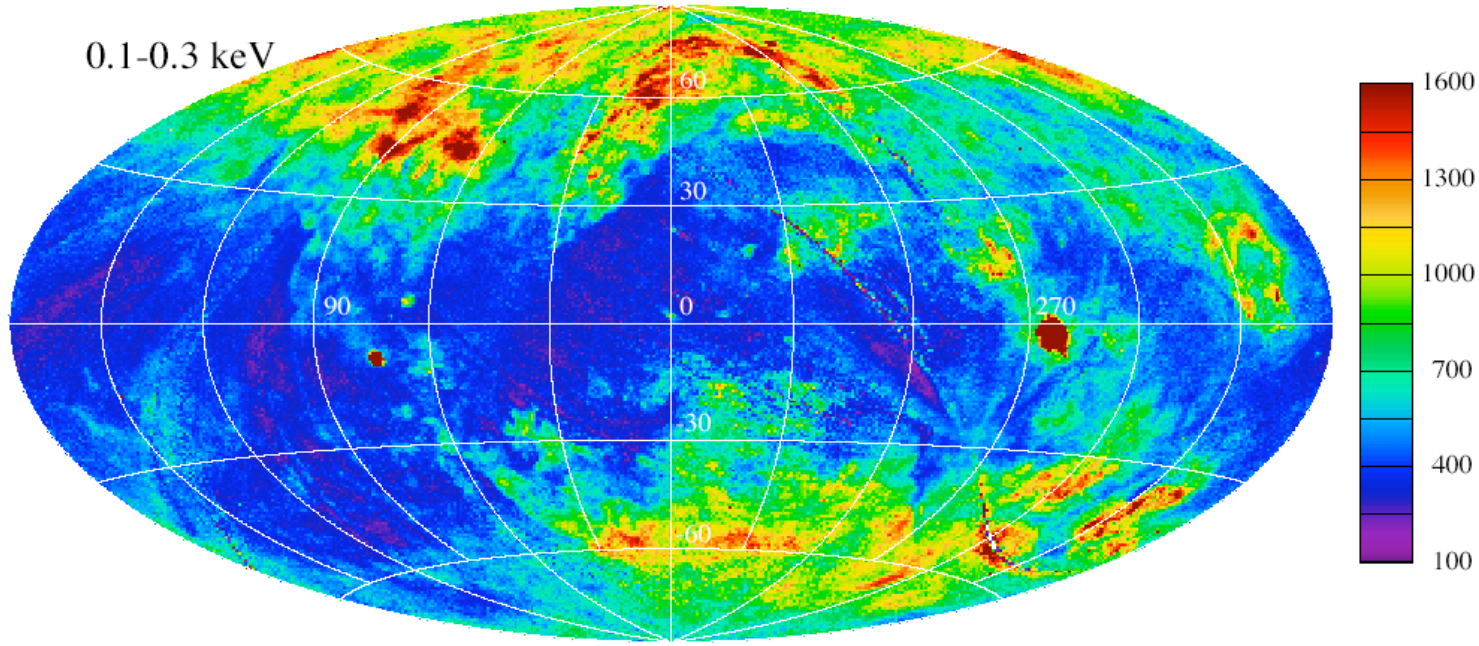
Conrad Dennerl went back and looked for comets crossed during Sky Survey.

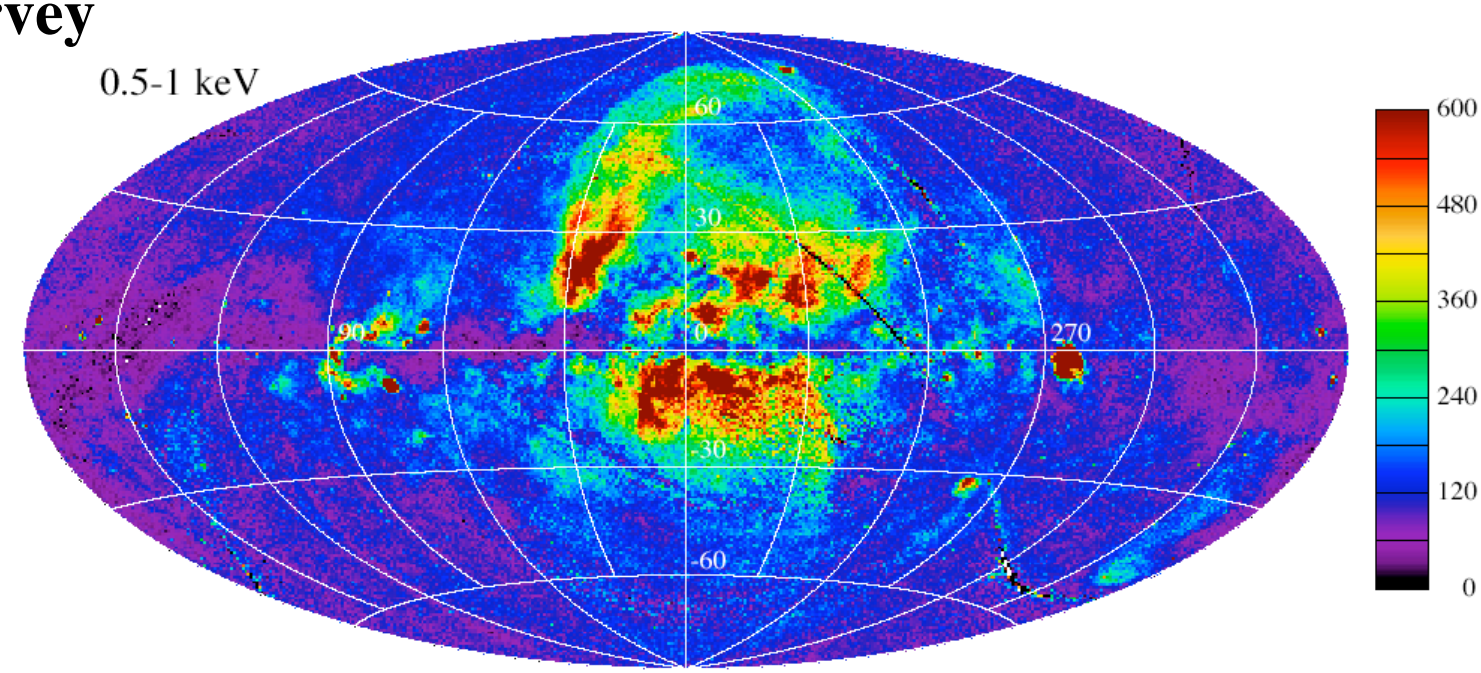
Found *all* at R < 2 a.u.

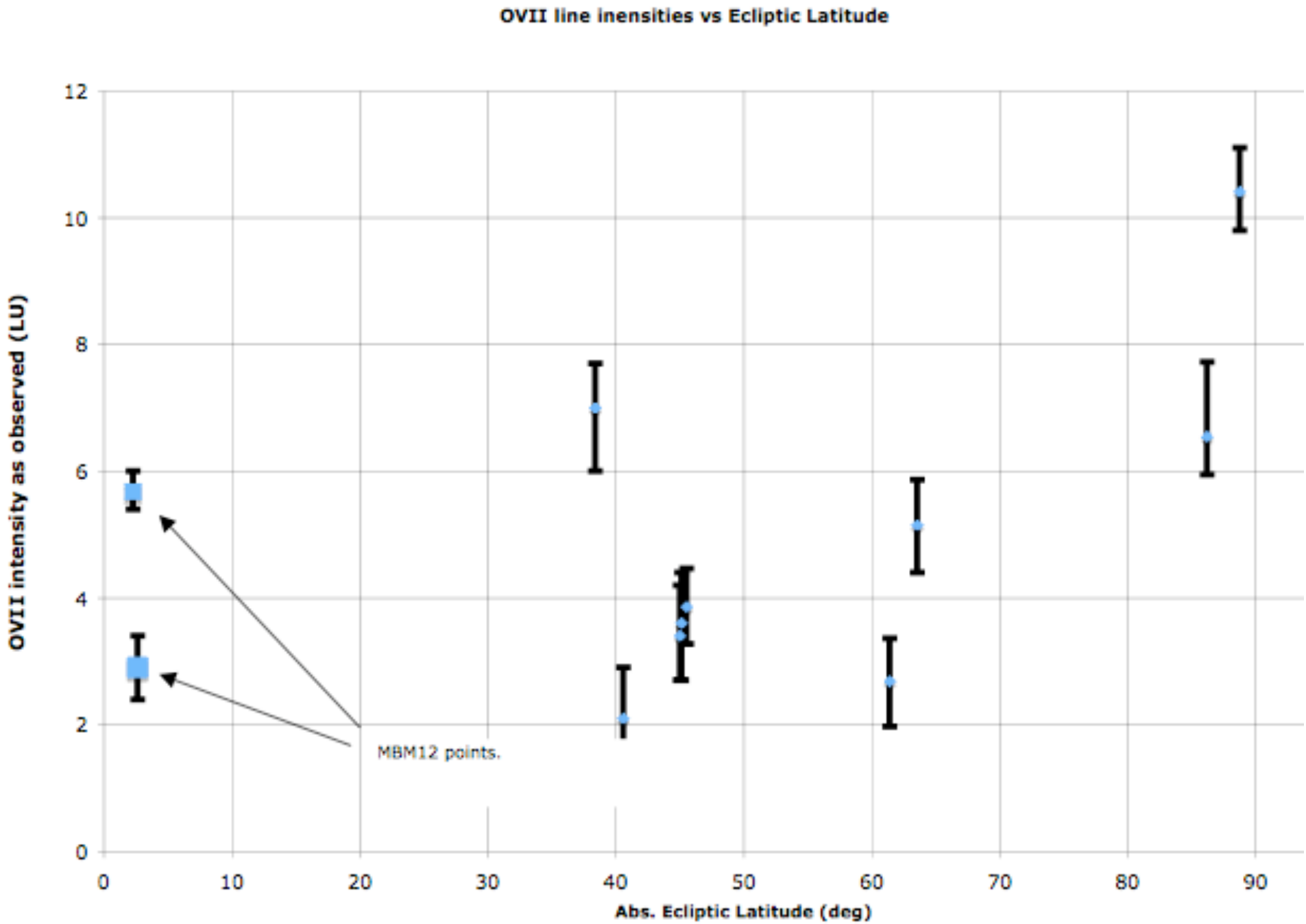
Interplanetary Solar Wind Charge Exchange

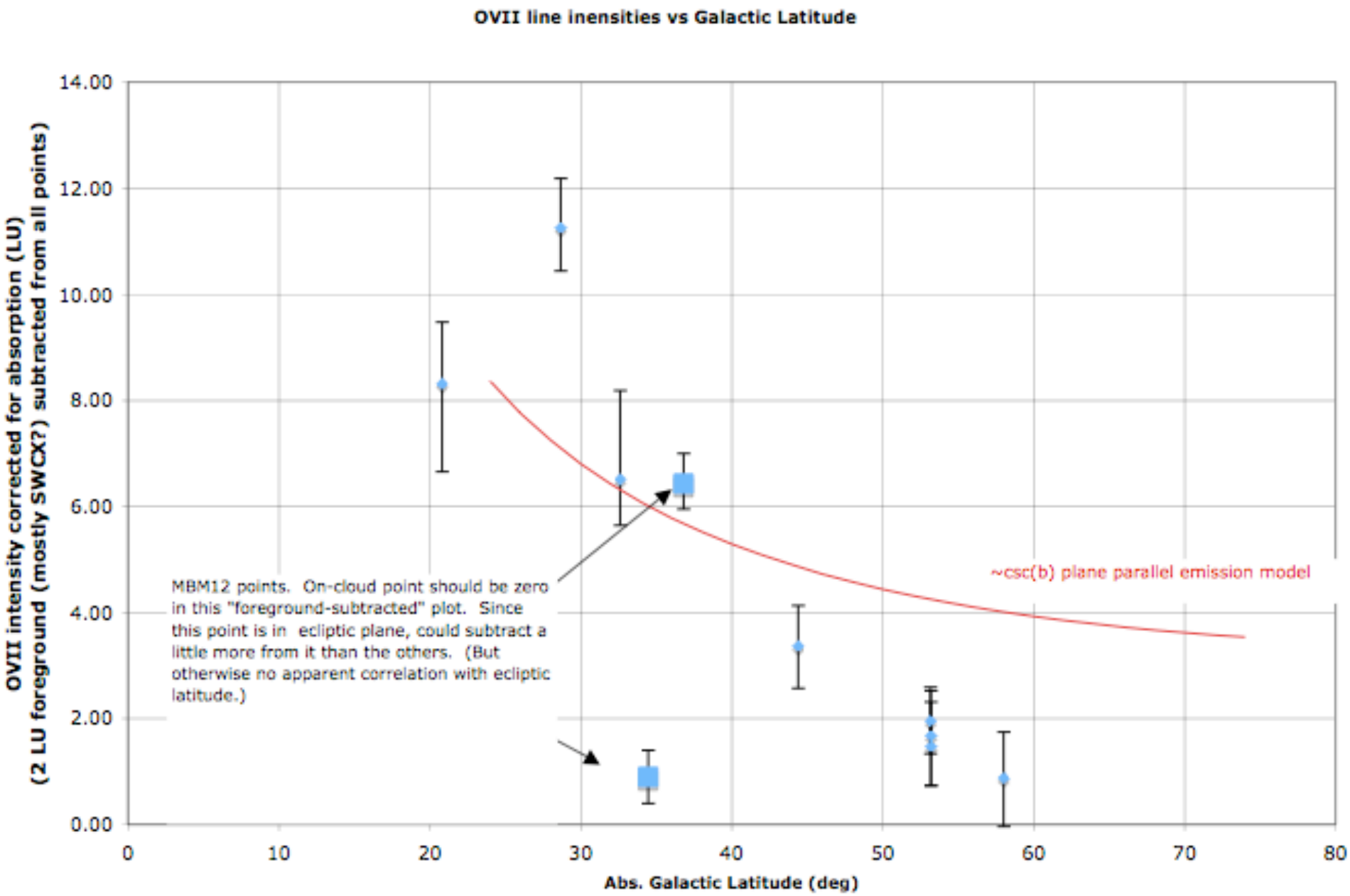


ROSAT All-Sky Survey

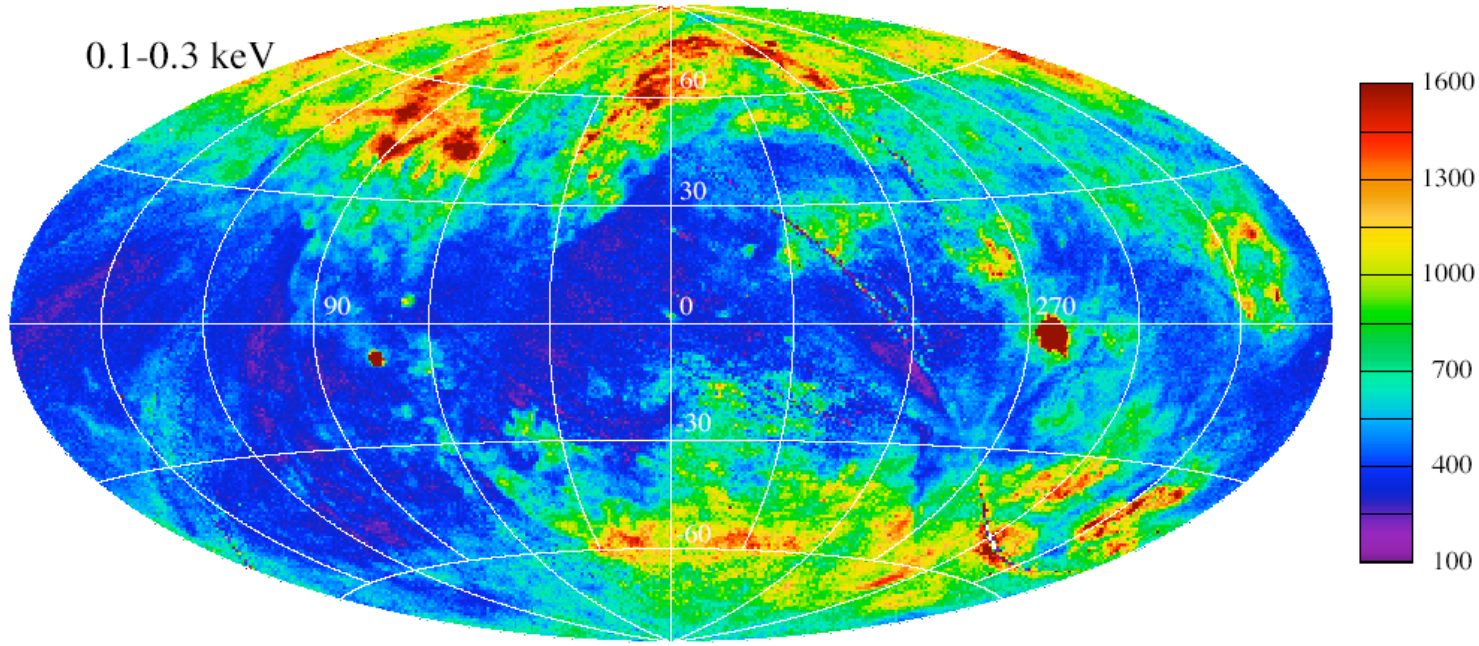


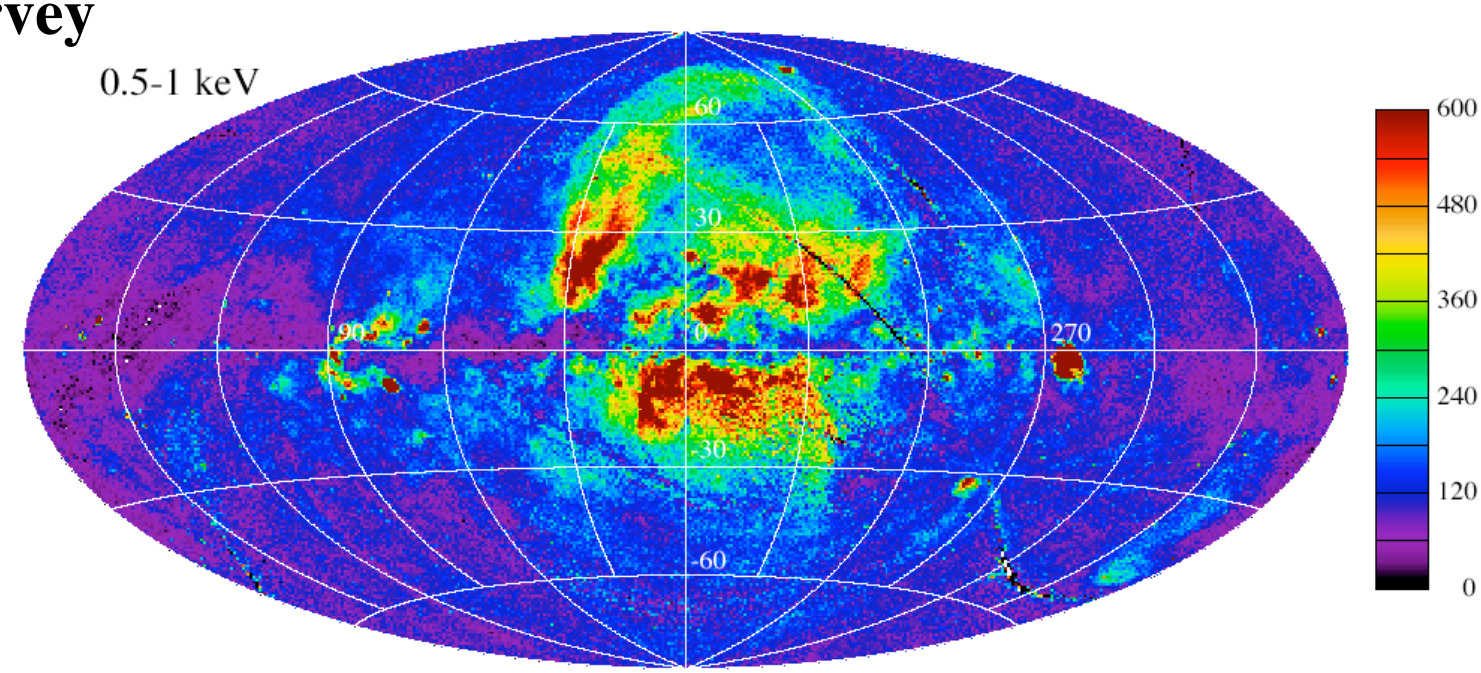


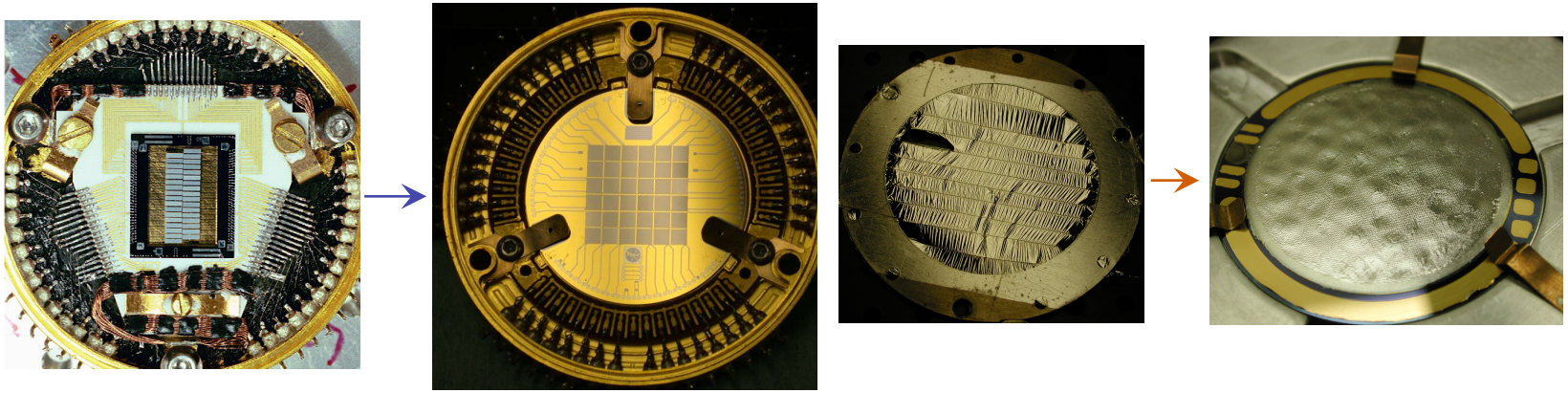

OVII line inensities vs Ecliptic Latitude
OVII intensity as observed (LU)
Abs. Ecliptic Latitude (deg)
MBM12 points.
0
2
4
6
8
10
12
0
10
20
30
40
50
60
70
80
90

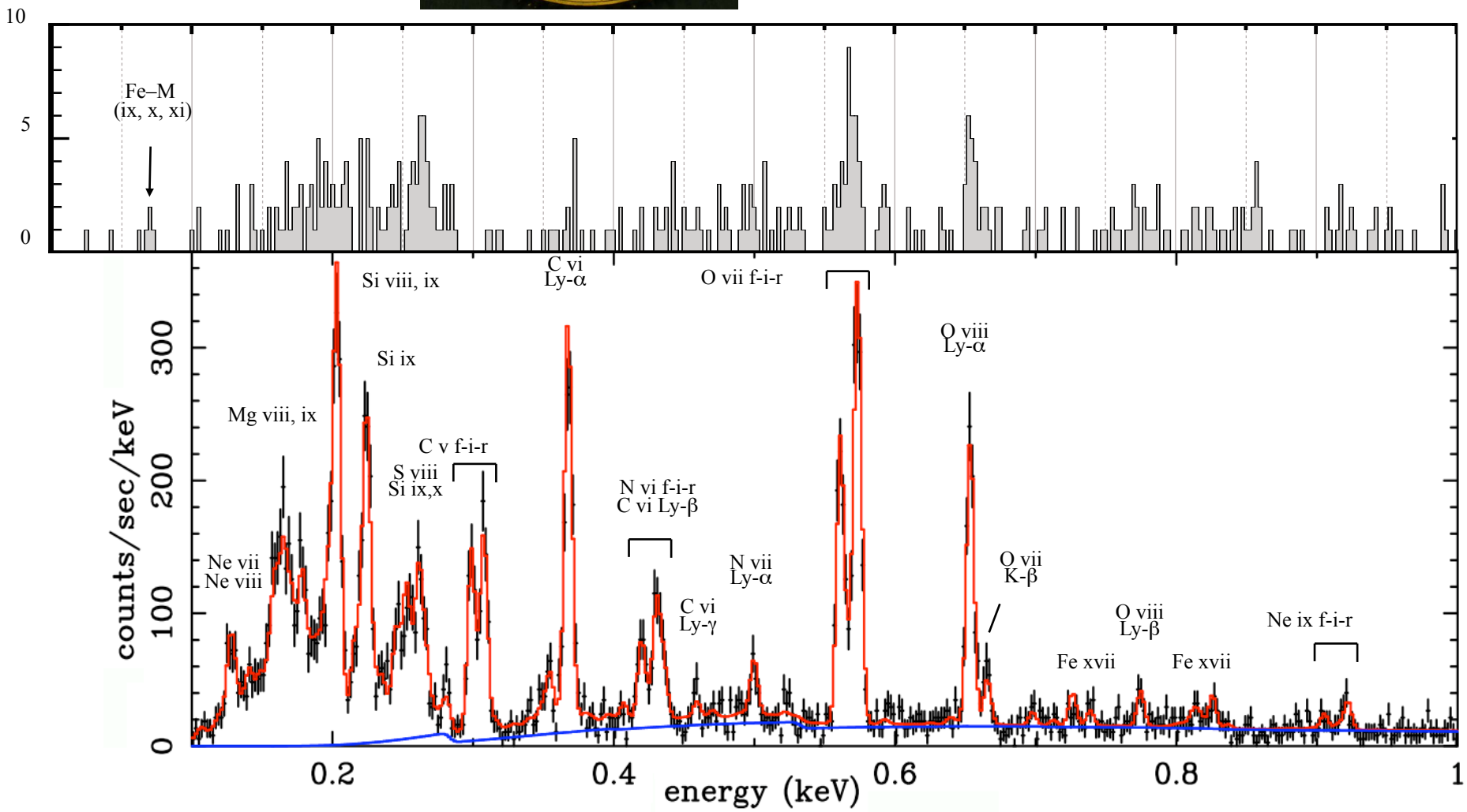

OVII line inensities vs Galactic Latitude
OVII intensity corrected for absorption (LU)
(2 LU foreground (mostly SWCX?) subtracted from all points)
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0
10
20
30
40
50
60
70
80
Abs. Galactic Latitude (deg)
MBM12 points. On-cloud point should be zero in this "foreground-subtracted" plot. Since this point is in ecliptic plane, could subtract a little more from it than the others. (But otherwise no apparent correlation with ecliptic latitude.)
~csc(b) plane parallel emission model

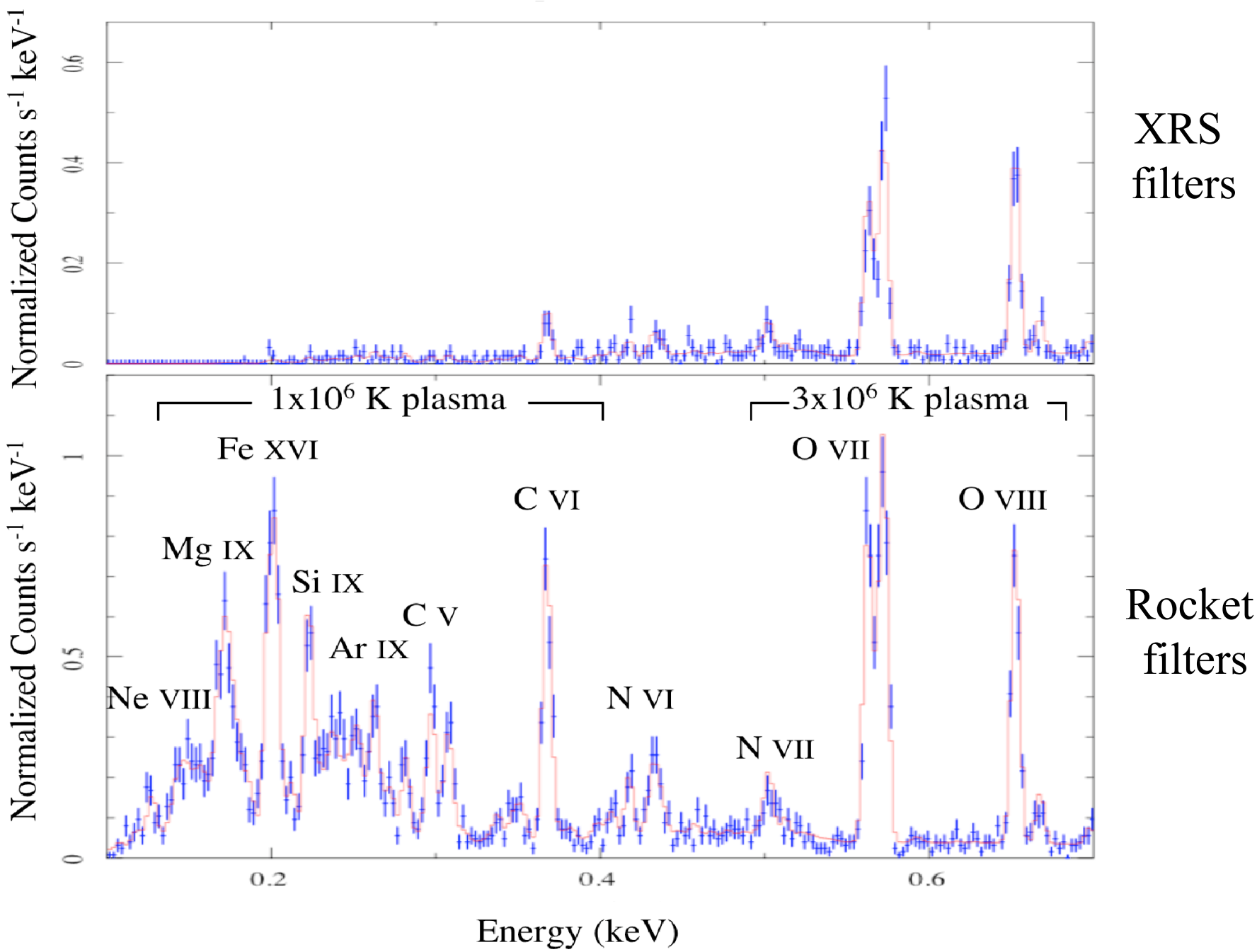
ROSAT All-Sky Survey

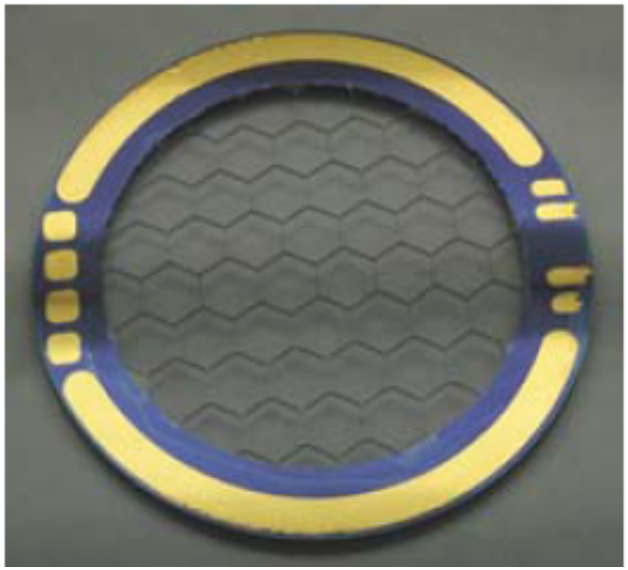
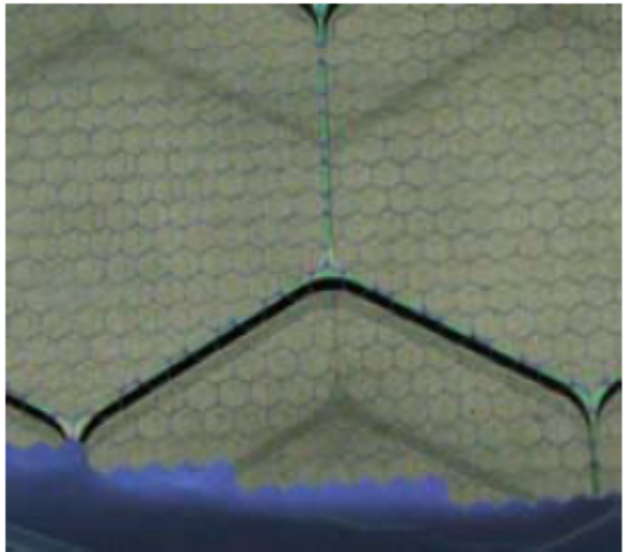
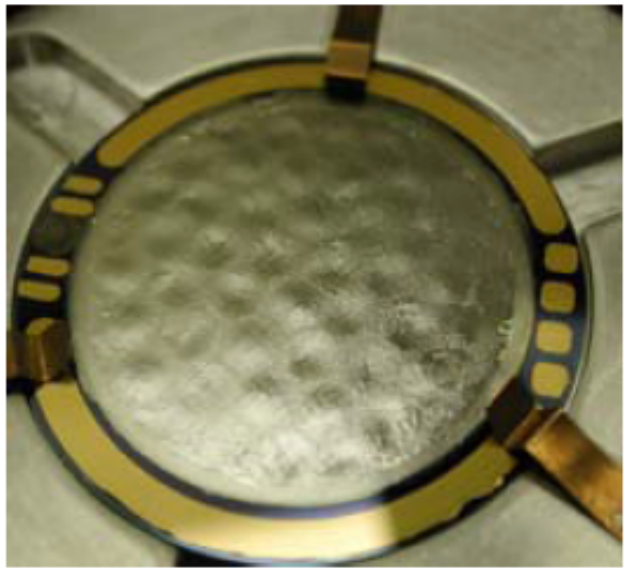






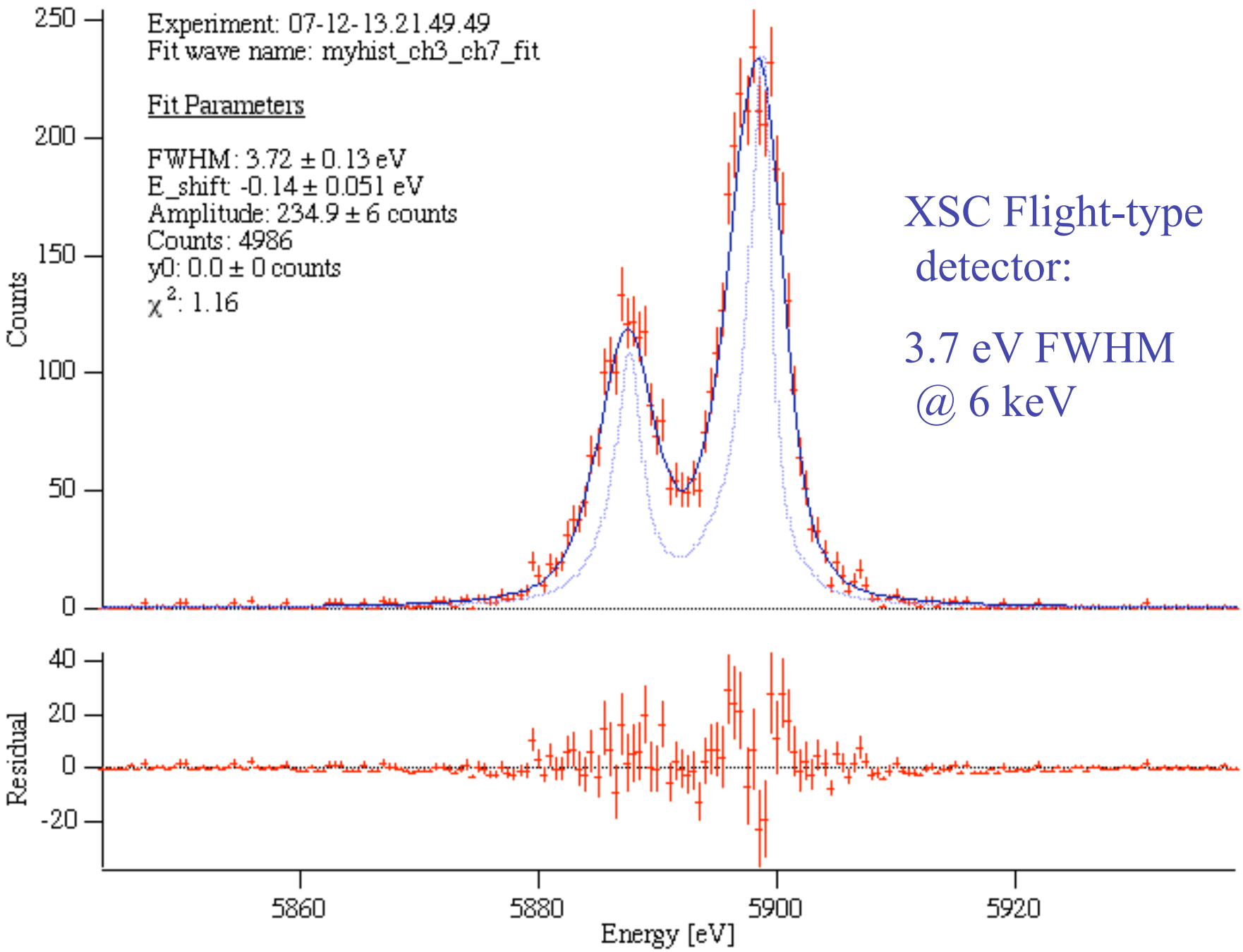

Fe–M
(ix, x, xi)
Si viii, ix
C vi
Ly-α
O vii f-i-r
O viii
Ly-α
Si ix
Mg viii, ix
C v f-i-r
S viii
Si ix,x
N vi f-i-r
C vi Ly-β
Ne vii
Ne viii
N vii
Ly-α
C vi
Ly-γ
O vii
K-β
O viii
Ly-β
Ne ix f-i-r
Fe xvii
Fe xvii
counts/sec/keV
energy (keV)
0
100
200
300
0.2
0.4
0.6
0.8
1
0
5
10


Normalized Counts s-1 keV-1
0
0.2
0.4
0.6
XRS filters
1x10^6 K plasma
3x10^6 K plasma
Fe XVI
Mg IX
Si IX
Ar IX
C V
C VI
Ne VIII
N VI
N VII
O VII
O VIII
Rocket filters
0.5
1
0.2
0.4
0.6
Energy (keV)

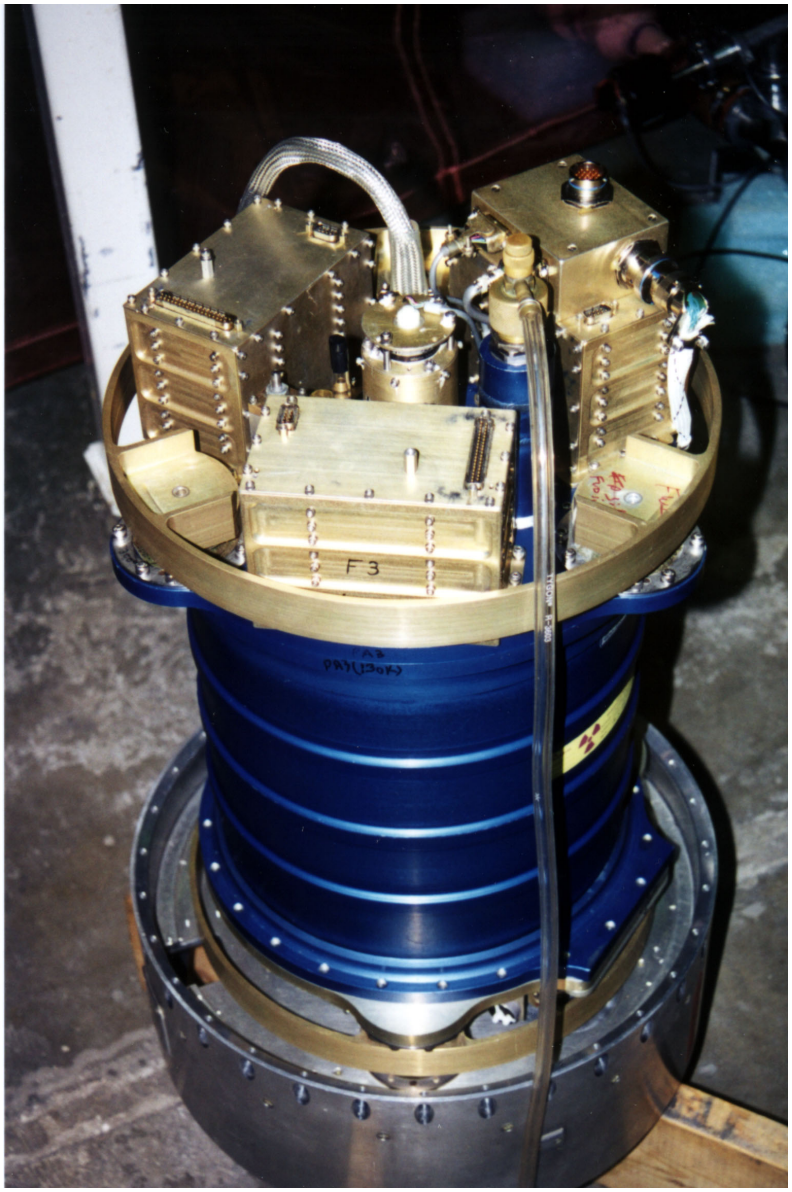
Two-level monolithic silicon mesh: 350 μm pitch front, 5 mm pitch back. 98% open, 95% over 1 steradian f.o.v. Ion-implanted integral deicing heater.

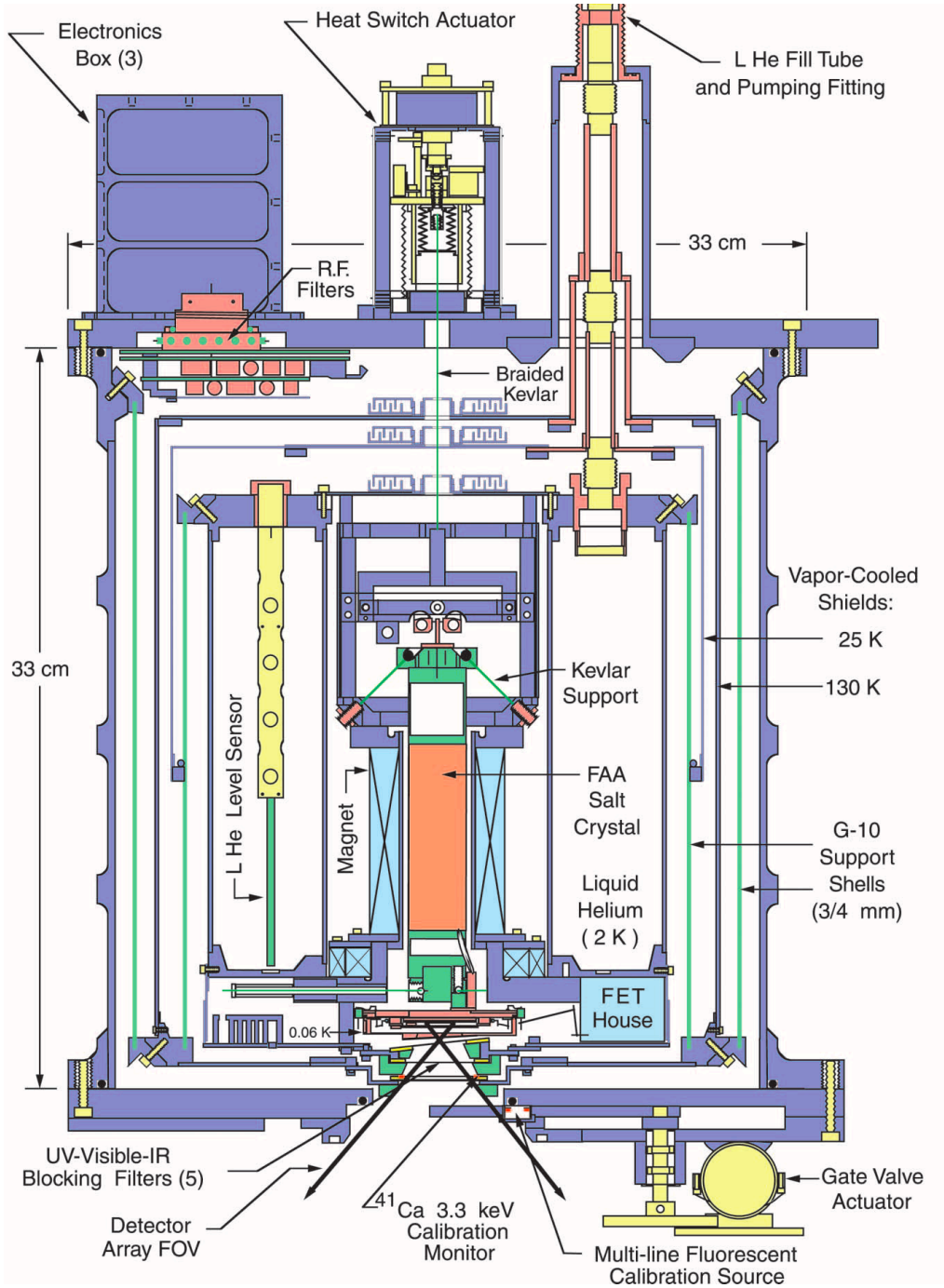
Filter: 20 nm Al on 45 nm polyimide



XSC Flight-type detector:

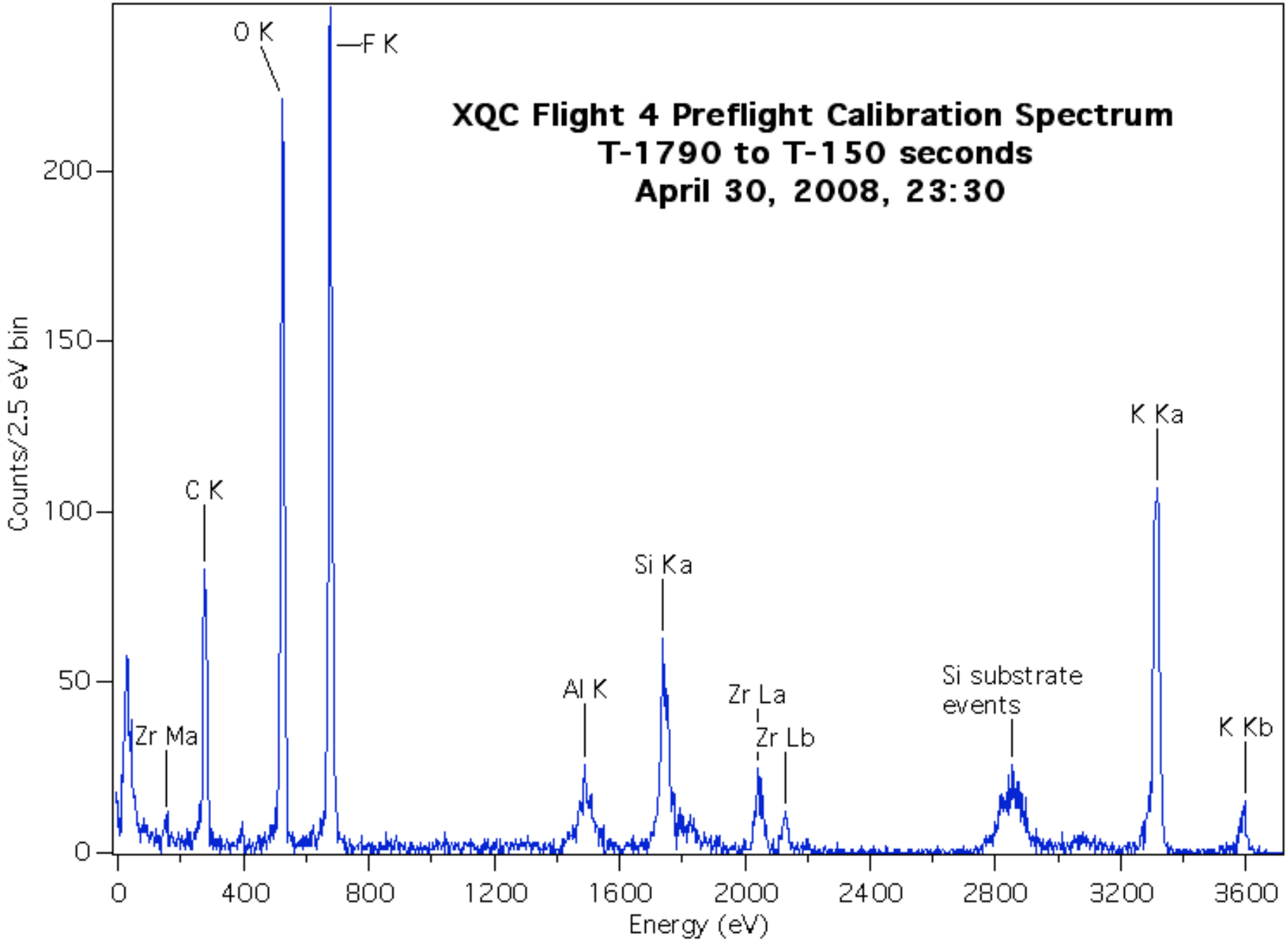
3.7 eV FWHM @ 6 keV

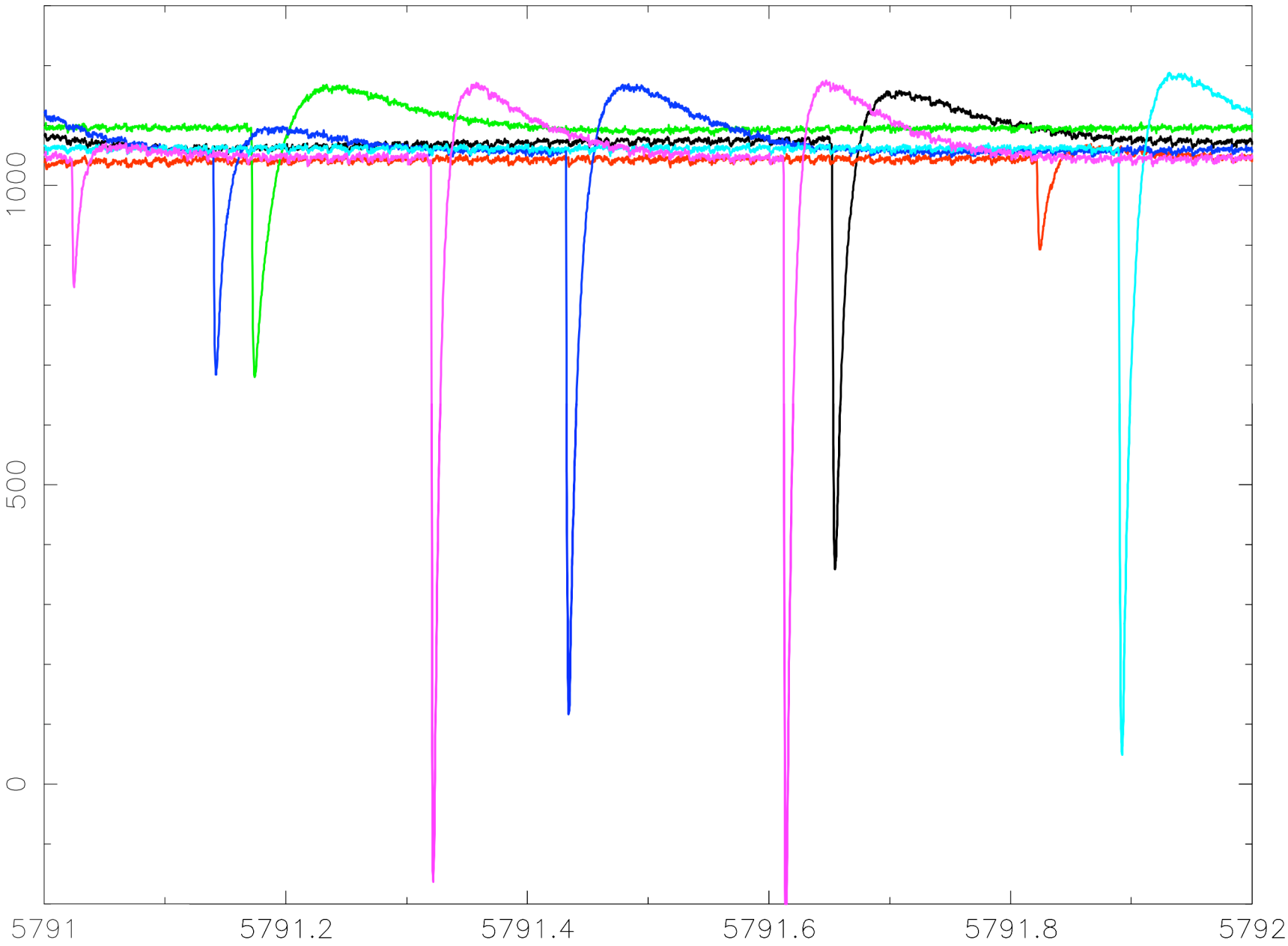

F3

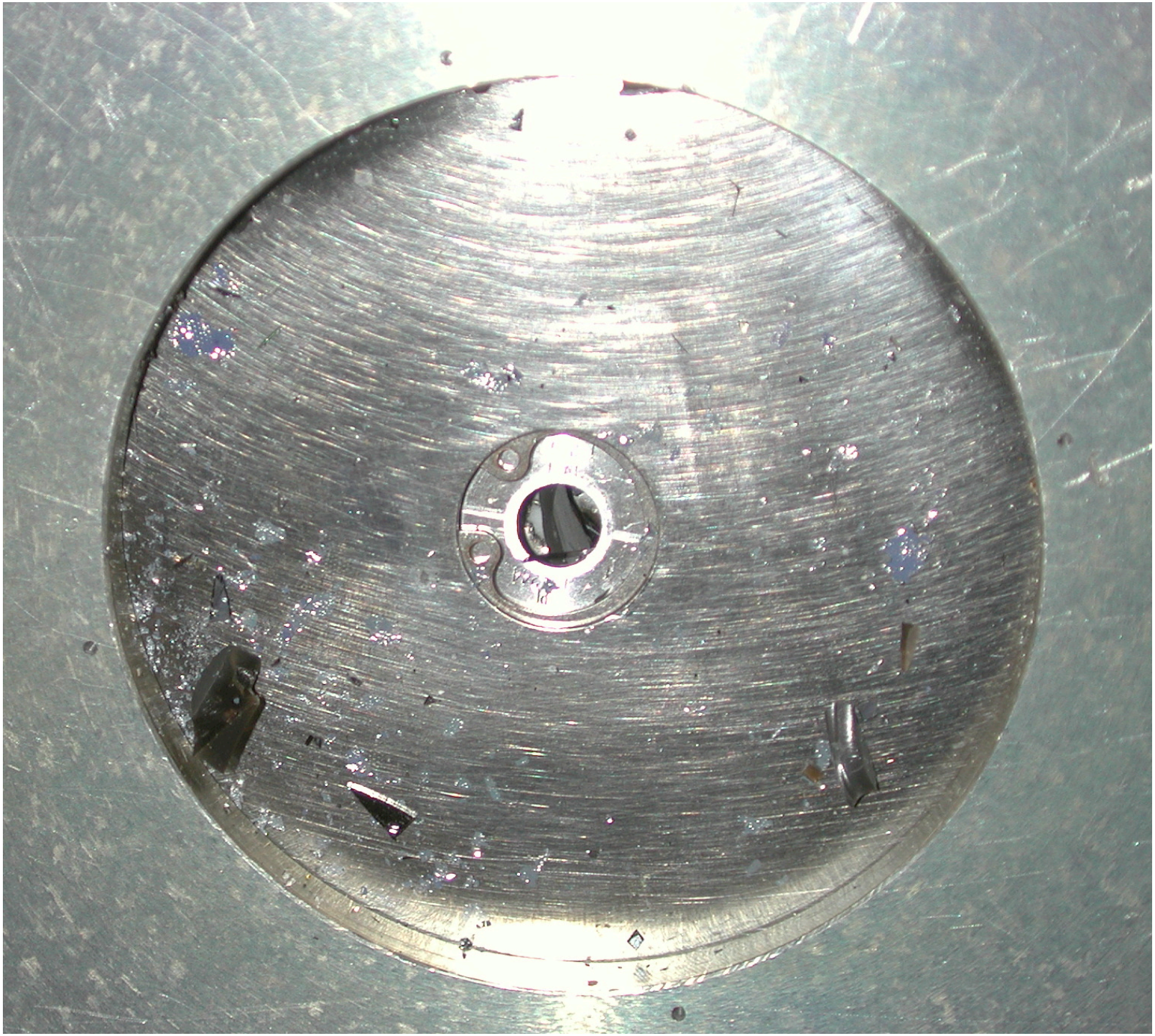

Electronics Box (3)
Heat Switch Actuator
L He Fill Tube and Pumping Fitting
33 cm
R.F. Filters
Braided Kevlar
33 cm
Vapor-Cooled Shields:
25 K
130 K
Kevlar Support
L He Level Sensor
Magnet
FAA Salt Crystal
G-10 Support Shells (3/4 mm)
Liquid Helium (2 K)
FET House
0.06 K
UV-Visible-IR Blocking Filters (5)
Detector Array FOV
41Ca 3.3 keV Calibration Monitor
Multi-line Fluorescent Calibration Source
Gate Valve Actuator

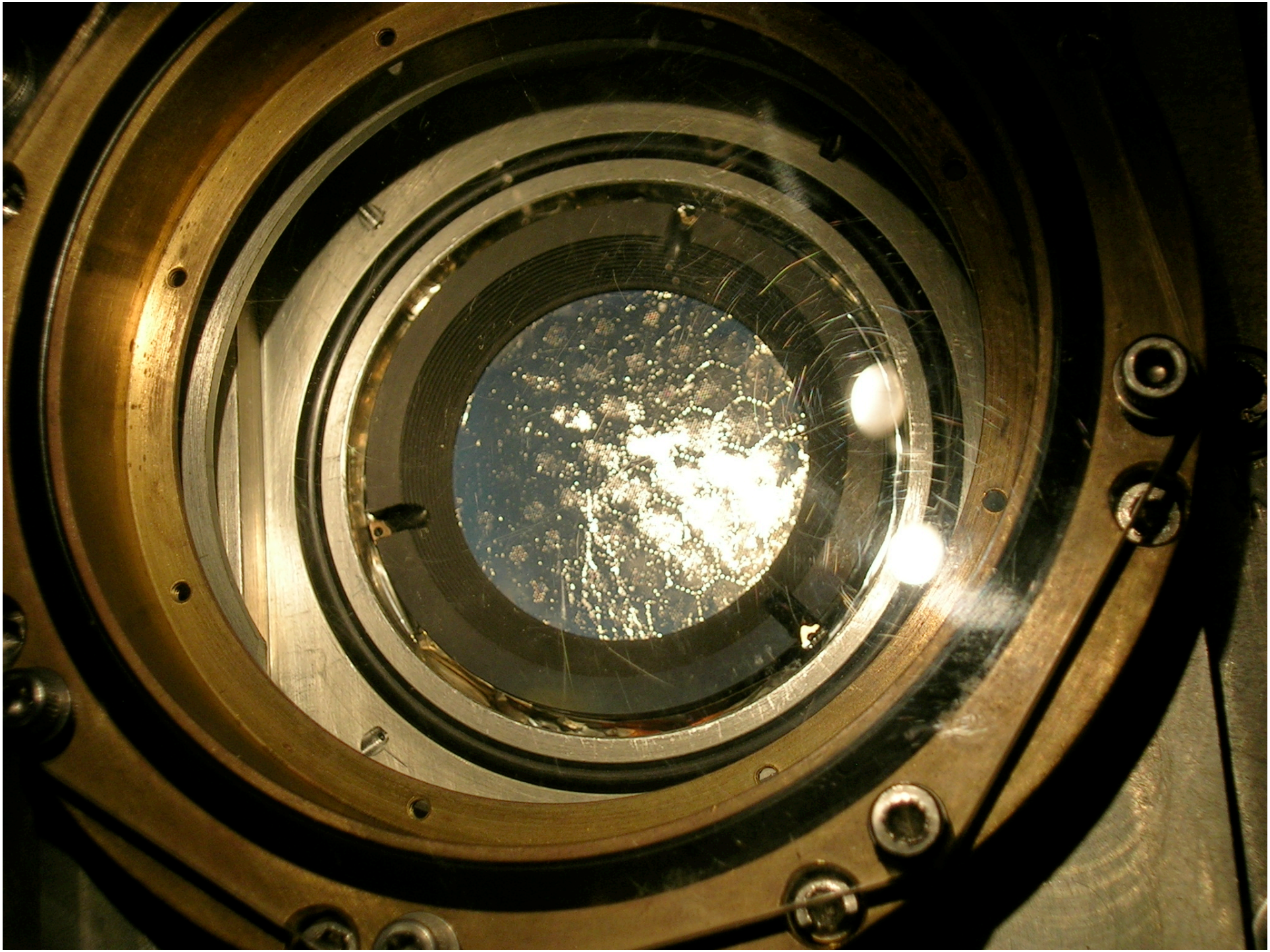
CAUTION

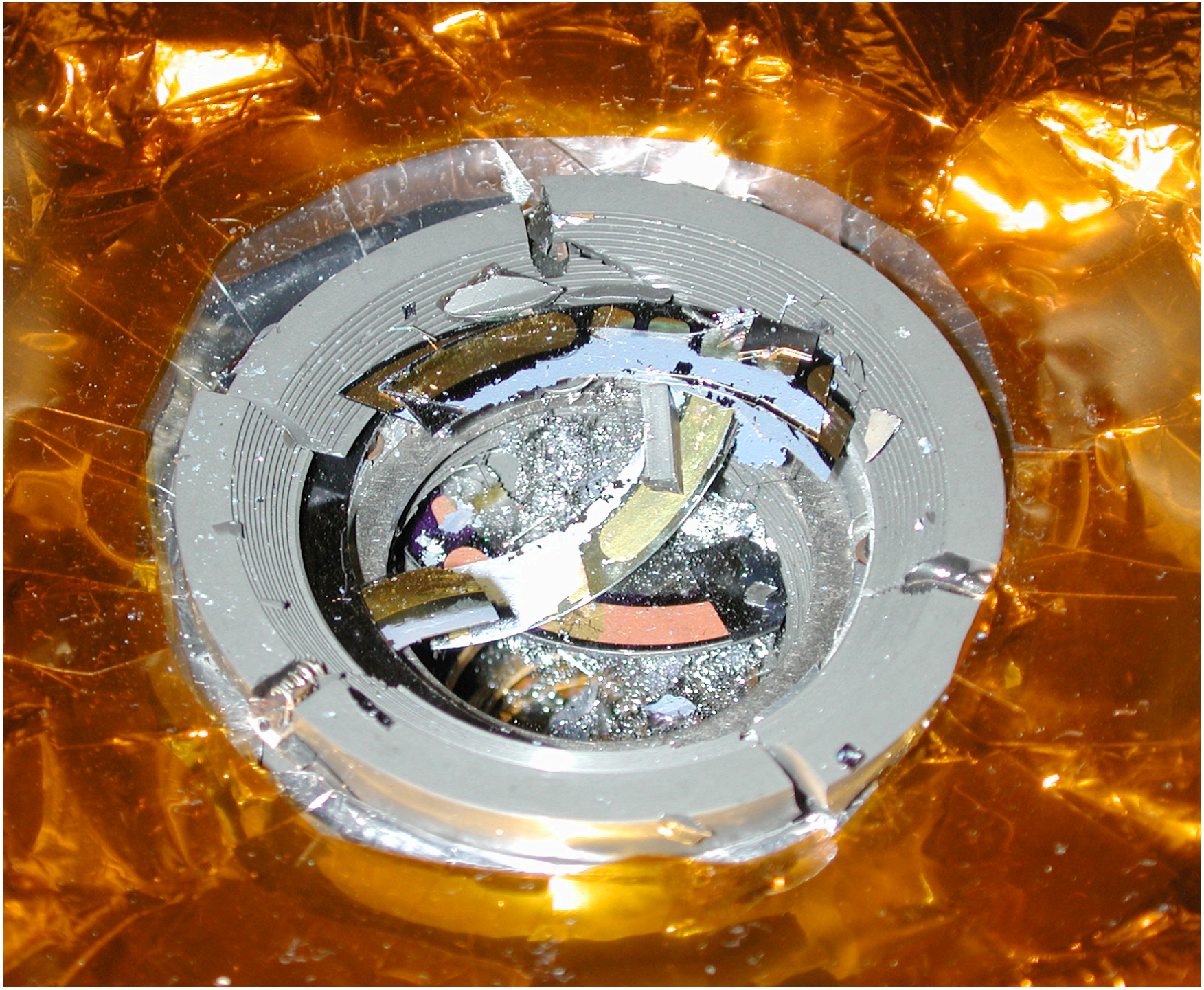
BEFORE FLIGHT
EXIT


XQC Flight 4 Preflight Calibration Spectrum
T-1790 to T-150 seconds
April 30, 2008, 23:30
O K
F K
C K
Zr Ma
Al K
Si Ka
Zr La
Zr Lb
Si substrate events
K Ka
K Kb
Counts/2.5 eV bin
Energy (eV)
0
50
100
150
200
0
400
800
1200
1600
2000
2400
2800
3200
3600

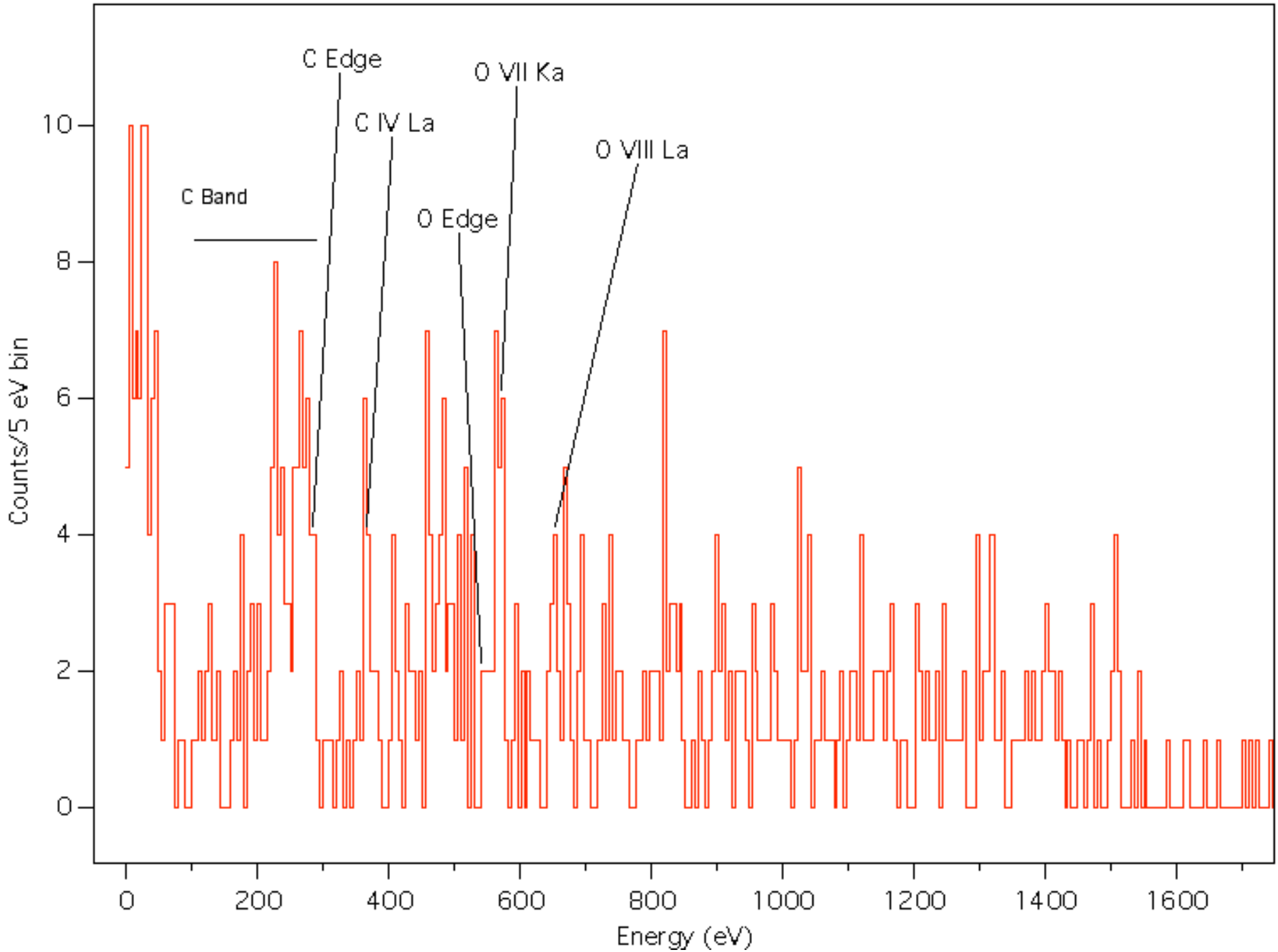

1000
500
0
5791
5791.2
5791.4
5791.6
5791.8
5792

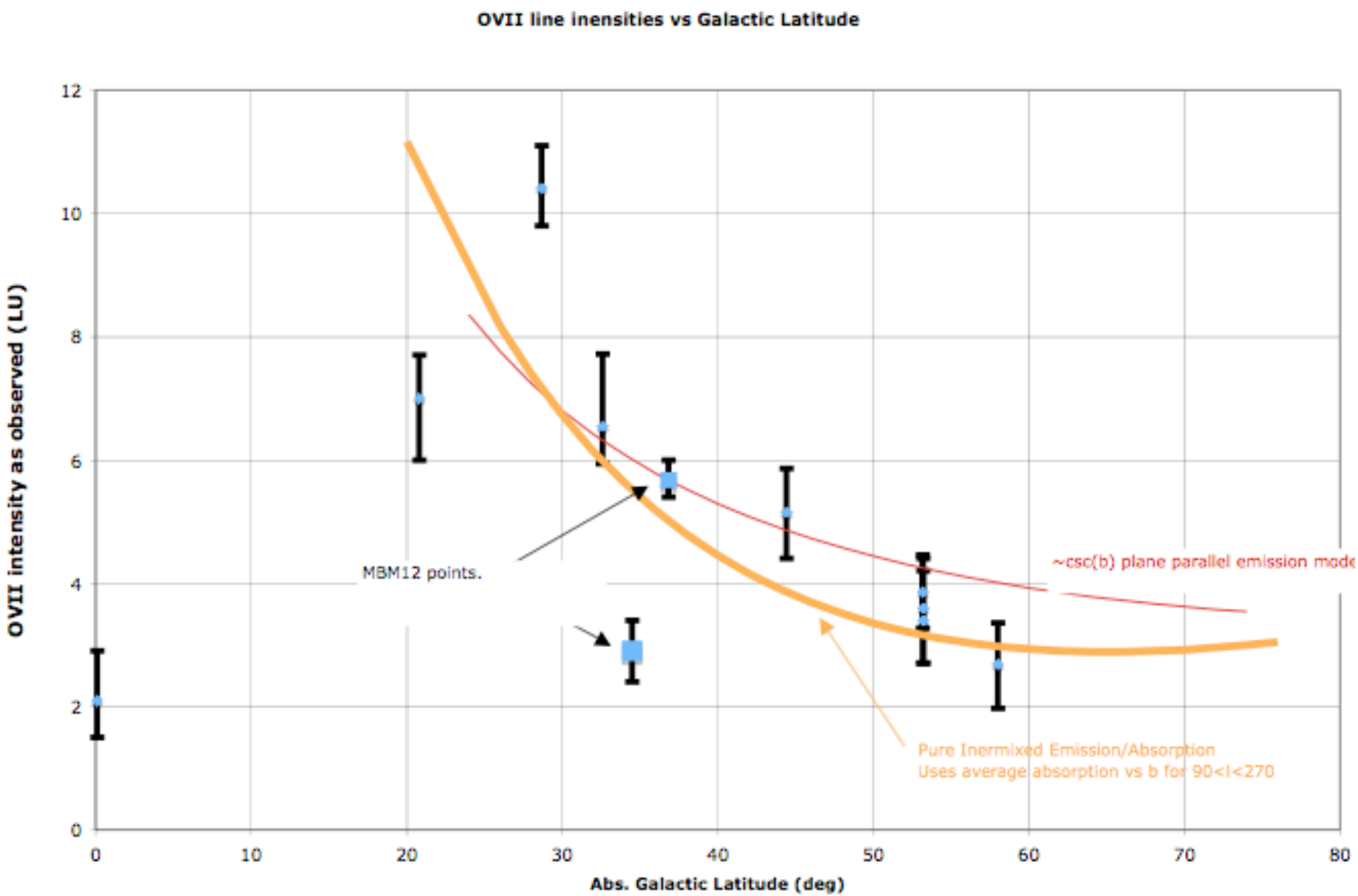


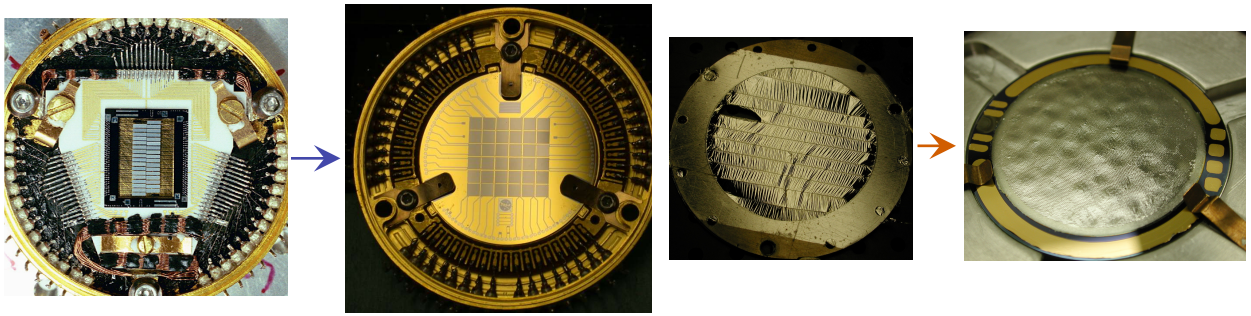


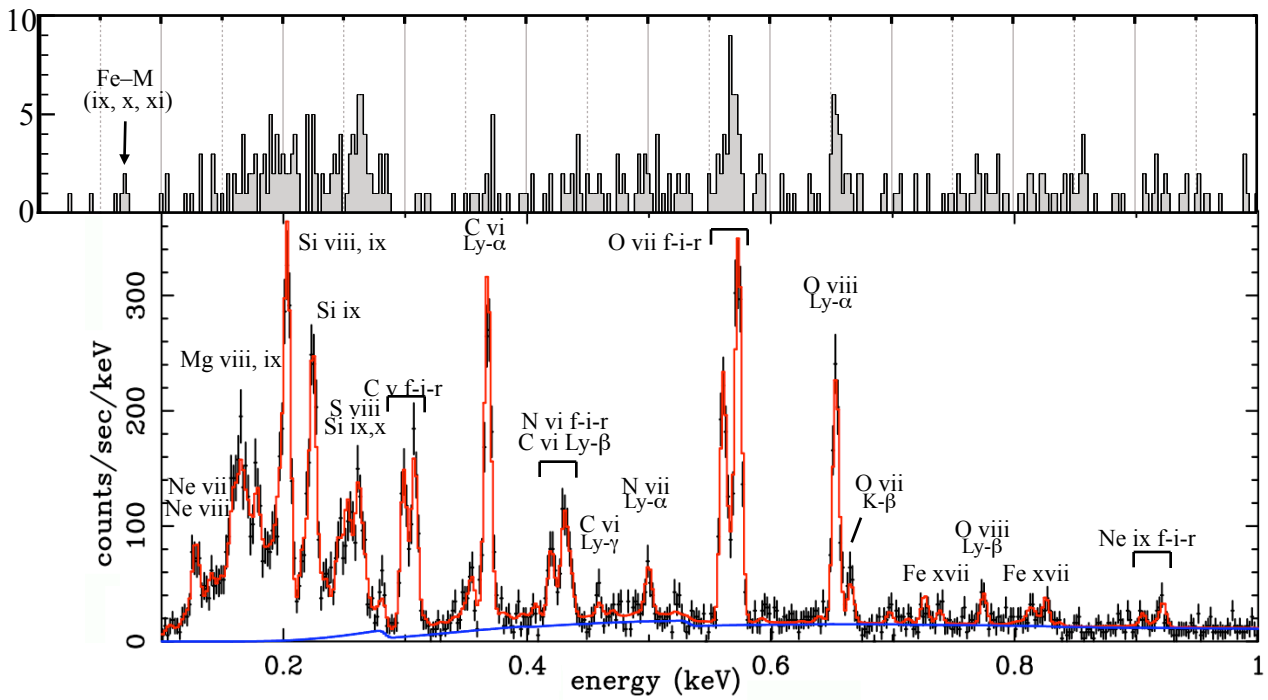


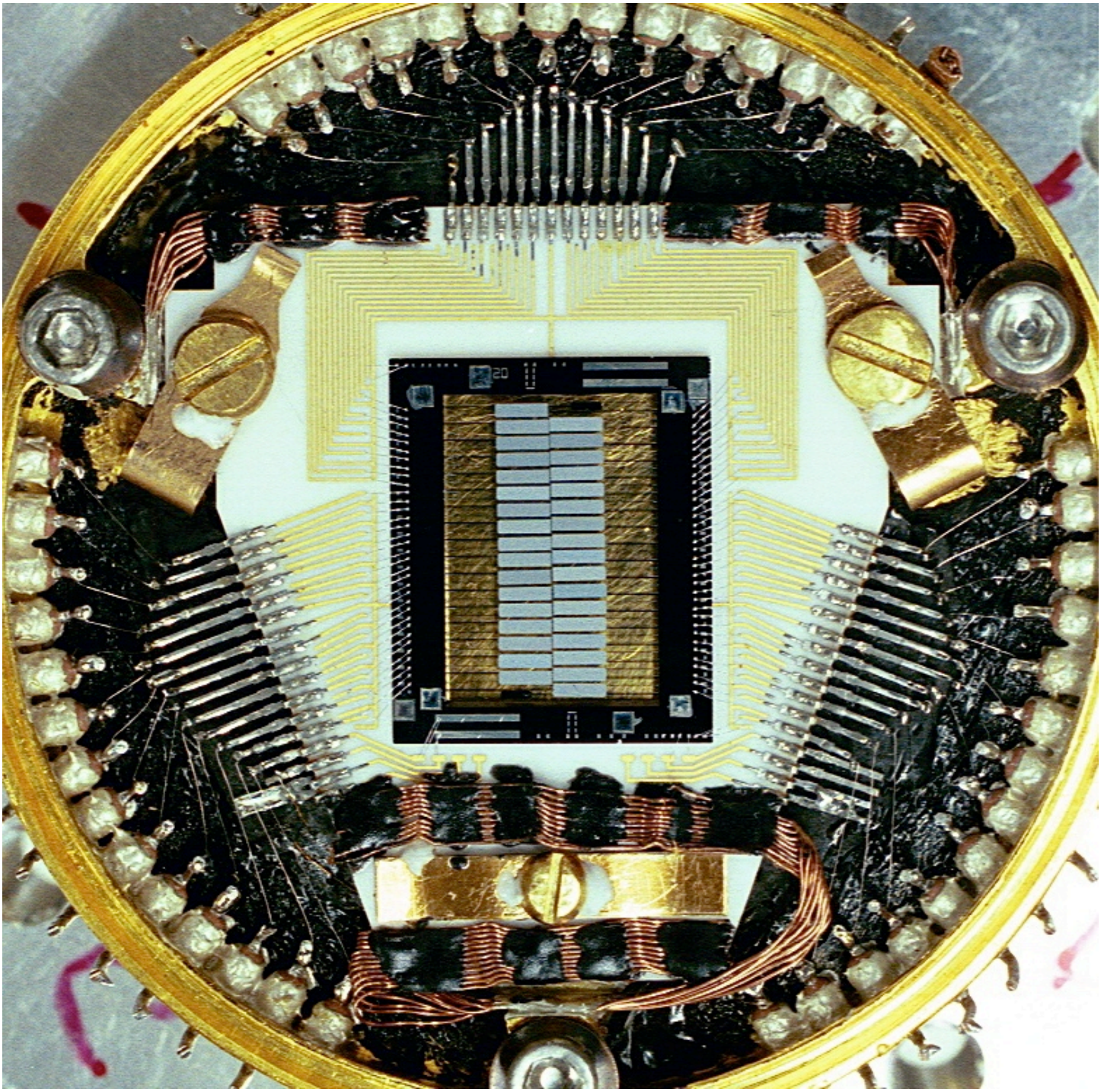
The End

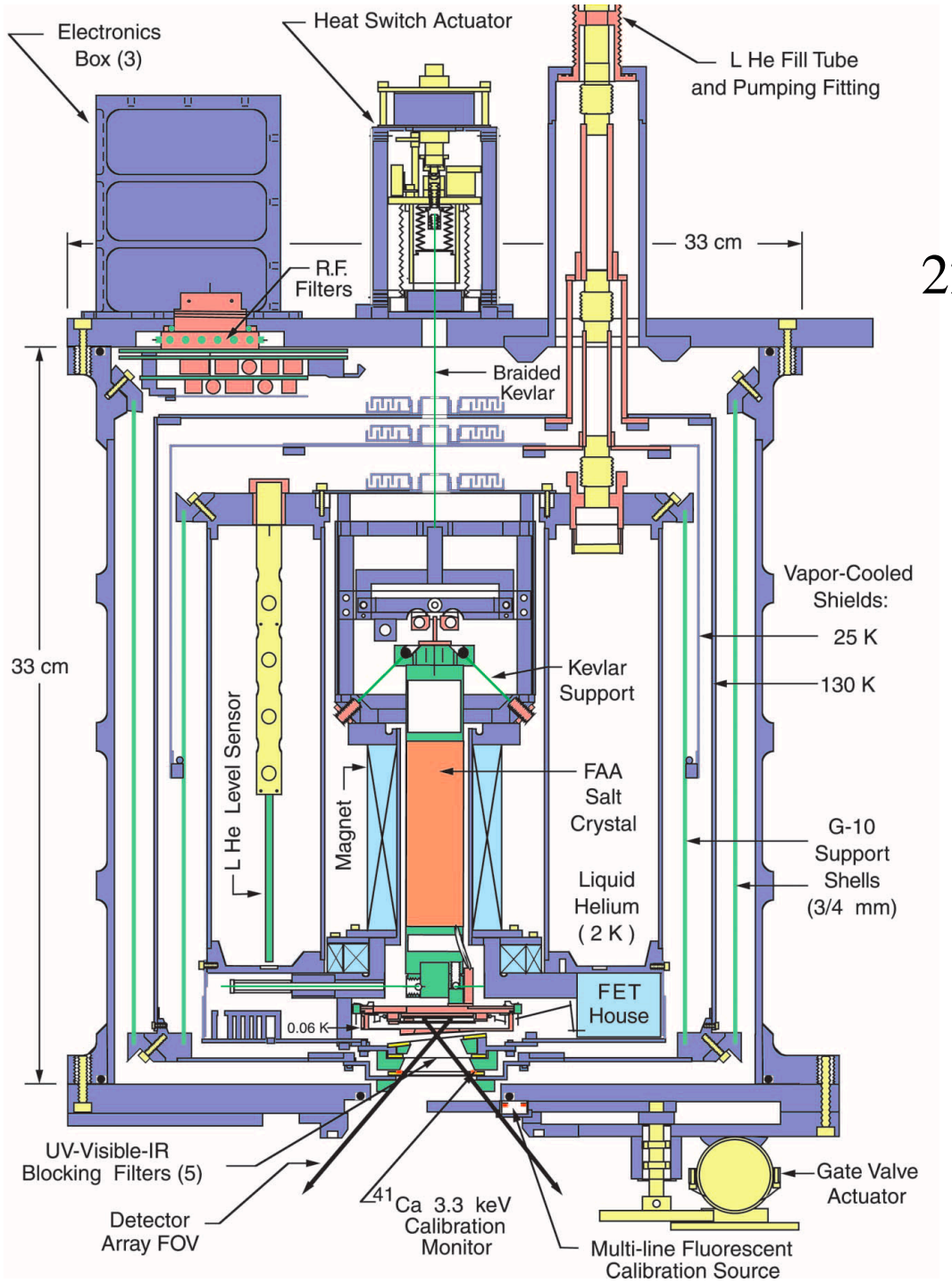

C Edge
O VII Ka
C IV La
O VIII La
C Band
O Edge
Counts/5 eV bin
Energy (eV)
0
2
4
6
8
10
0
200
400
600
800
1000
1200
1400
1600


OVII line inensities vs Galactic Latitude
OVII intensity as observed (LU)
Abs. Galactic Latitude (deg)
0
2
4
6
8
10
12
0
10
20
30
40
50
60
70
80
MBM12 points.
~csc(b) plane parallel emission mode
Pure Inermixed Emission/Absorption
Uses average absorption vs b for 90<l<270




Fe–M
(ix, x, xi)
Si viii, ix
C vi
Ly-α
O vii f-i-r
O viii
Ly-α
Si ix
Mg viii, ix
C v f-i-r
S viii
Si ix,x
N vi f-i-r
C vi Ly-β
N vii
Ly-α
O vii
K-β
Ne vii
Ne viii
C vi
Ly-γ
O viii
Ly-β
Ne ix f-i-r
Fe xvii
Fe xvii
counts/sec/keV
energy (keV)
0
100
200
300
0.2
0.4
0.6
0.8
1
10
5
0




Electronics Box (3)
Heat Switch Actuator
L He Fill Tube and Pumping Fitting
33 cm
R.F. Filters
Braided Kevlar
33 cm
Vapor-Cooled Shields:
25 K
130 K
Kevlar Support
L He Level Sensor
Magnet
FAA Salt Crystal
G-10 Support Shells (3/4 mm)
Liquid Helium (2 K)
FET House
0.06 K
UV-Visible-IR Blocking Filters (5)
Detector Array FOV
41Ca 3.3 keV Calibration Monitor
Multi-line Fluorescent Calibration Source
Gate Valve Actuator

22 kg