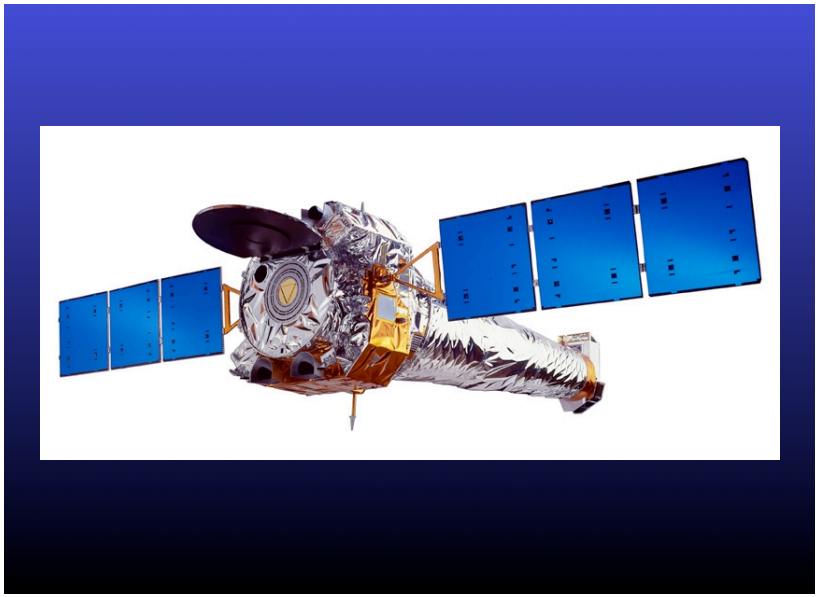

XMM-Newton — Chandra

Blazar

Flux Comparison

5th IACHEC, April 2010

esa

XMM-Newton

Michael Smith, ESAC

Blazar Sample

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Objective: Comparison of XMM-Newton — Chandra fluxes in various bands.

For this we're using a sample of Blazars:
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16 coordinated XMM-Newton / Chandra observations, resulting in
31 strictly simultaneous GTIs for flux comparison.

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Data reduction:
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Energy bands are those used in the XMM-Newton Cross Cal Archive:
- 0.15 – 0.33 keV (Lower EPIC bound – Lower RGS bound)
- 0.33 – 0.54 keV (Up to the O-edge)
- 0.54 – 0.85 keV (O-VII, O-VIII)
- 0.85 – 1.50 keV (Ne-IX, Ne-X)
- 1.50 – 4.00 keV
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➡ Use as benchmark the **Joint Fit Flux** of all instruments in use in a particular exposure.

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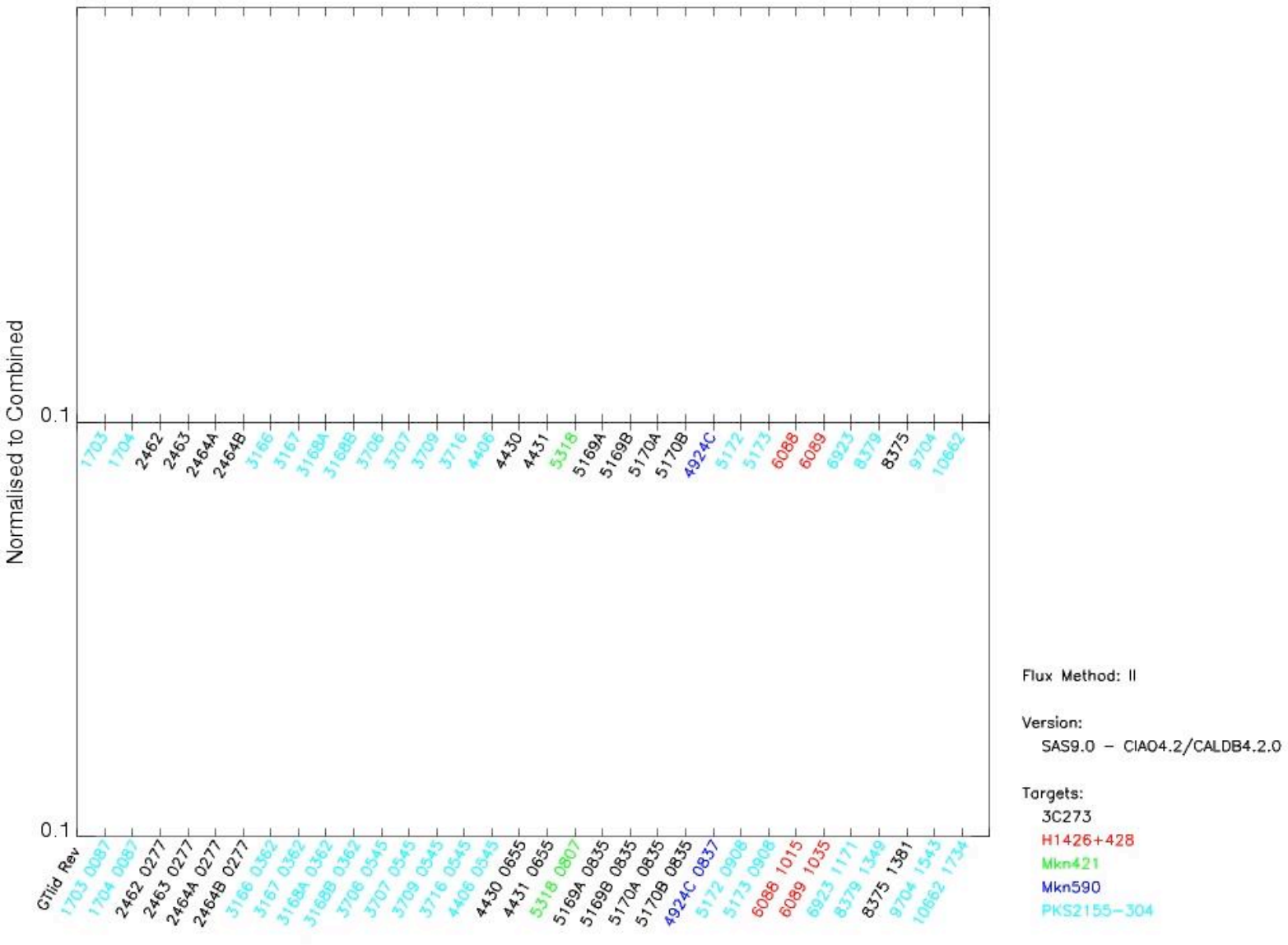
Normalised to Combined
0.1
0.1
1703
1704
2462
2463
2464A
2464B
3166
3167
3168A
3168B
3706
3707
3709
3716
4406
4430
4431
5318
5169A
5169B
5170A
5170B
4924C
5172
5173
6088
6089
6923
8379
8375
9704
10662
GTiid Rev
1703 0087
1704 0087
2462 0277
2463 0277
2464A 0277
2464B 0277
3166 0362
3167 0362
3168A 0362
3168B 0362
3706 0545
3707 0545
3709 0545
3716 0545
4406 0545
4430 0655
4431 0655
5318 0807
5169A 0835
5169B 0835
5170A 0835
5170B 0835
4924C 0837
5172 0908
5173 0908
6088 1015
6089 1035
6923 1171
8379 1349
8375 1381
9704 1543
10662 1734
Flux Method: II
Version:
SAS9.0 – CIAO4.2/CALDB4.2.0
Targets:
3C273
H1426+428
Mkn421
Mkn590
PKS2155-304

Results

PN (TIMING)
M1 (TIMING)
M2 (TIMING)
R1
R2

Normalised to Combined

0.1

1703 1704 2462 2463 2464A 2464B 3166 3167 3168A 3168B 3706 3707 3709 3716 4406 4430 4431 5318 5169A 5169B 5170A 5170B 4924C 5172 5173 6088 6089 6923 8379 8375 9704 10662

0.1

GTiid Rev
1703 0087 1704 0087 2462 0277 2463 0277 2464A 0277 2464B 0277 3166 0362 3167 0362 3168A 0362 3168B 0362 3706 0545 3707 0545 3709 0545 3716 0545 4406 0545 4430 0655 4431 0655 5318 0807 5169A 0835 5169B 0835 5170A 0835 5170B 0835 4924C 0837 5172 0908 5173 0908 6088 1015 6089 1035 6923 1171 8379 1349 8375 1381 9704 1543 10662 1734

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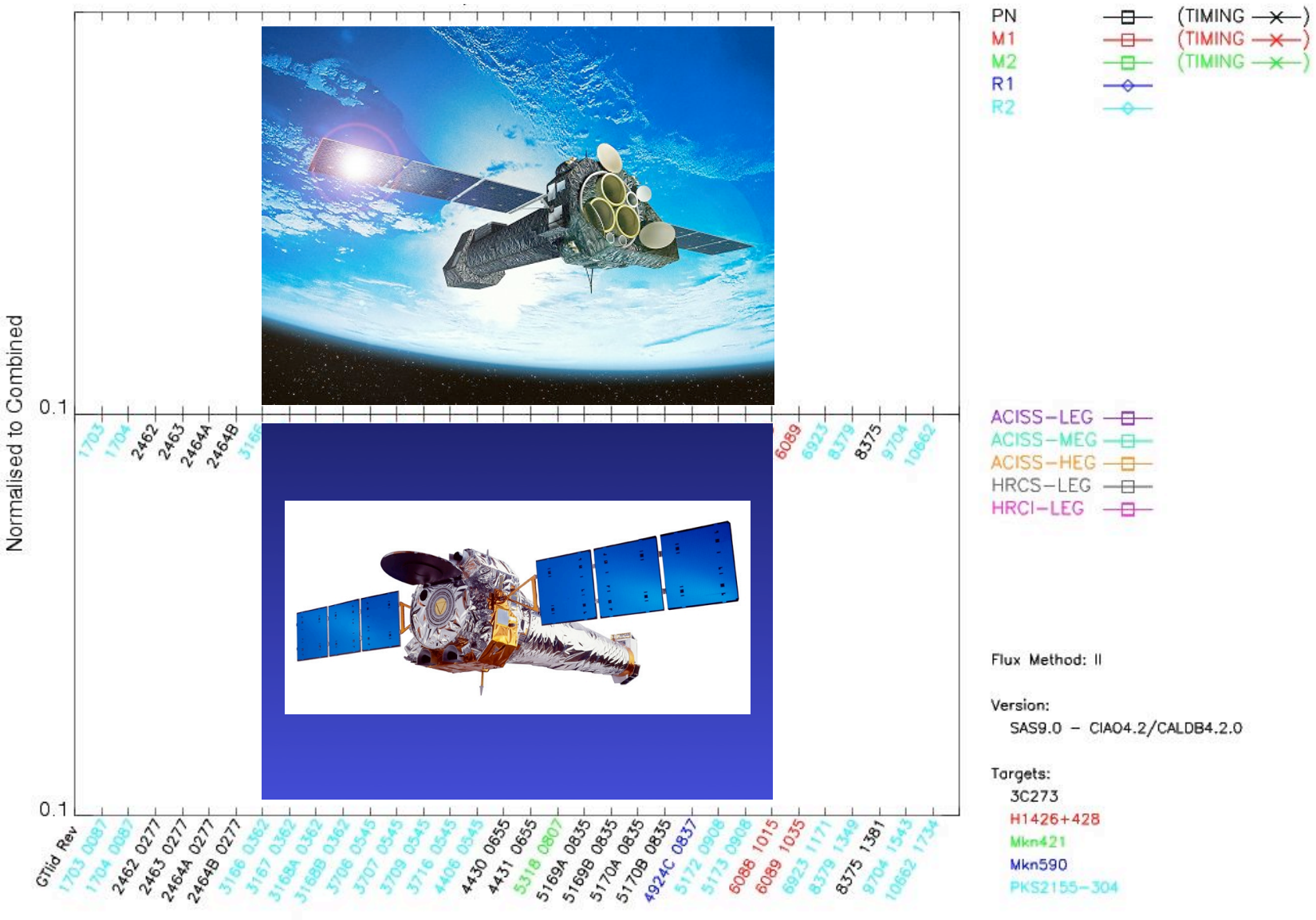
PN
M1
M2
R1
R2
(TIMING
(TIMING
(TIMING
ACISS-LEG
ACISS-MEG
ACISS-HEG
HRCS-LEG
HRCI-LEG
Normalised to Combined
0.1
0.1
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1703 0087
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2462 0277
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3166 0362
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3706 0545
3707 0545
3709 0545
3716 0545
4406 0545
4430 0655
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5318 0807
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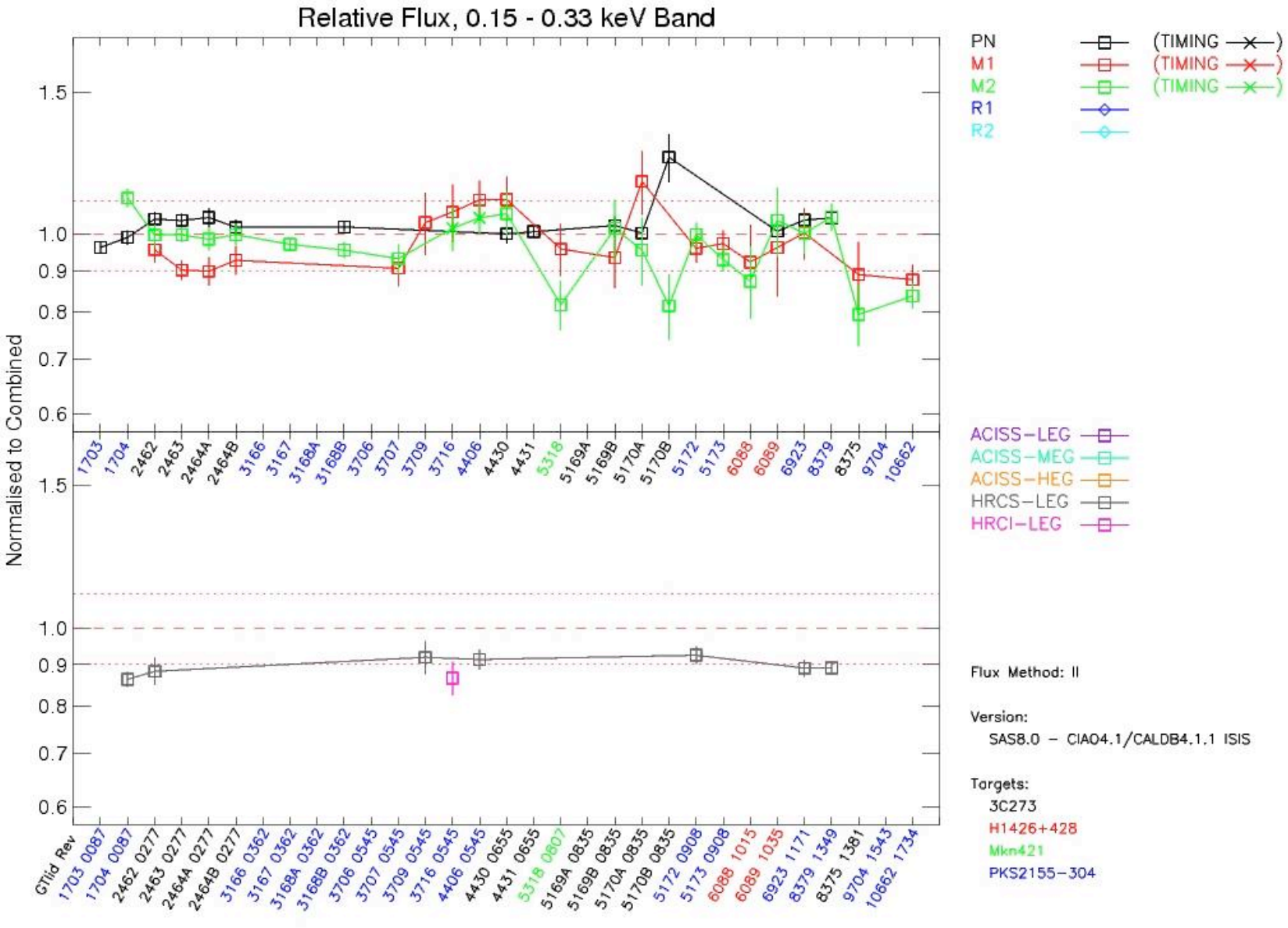
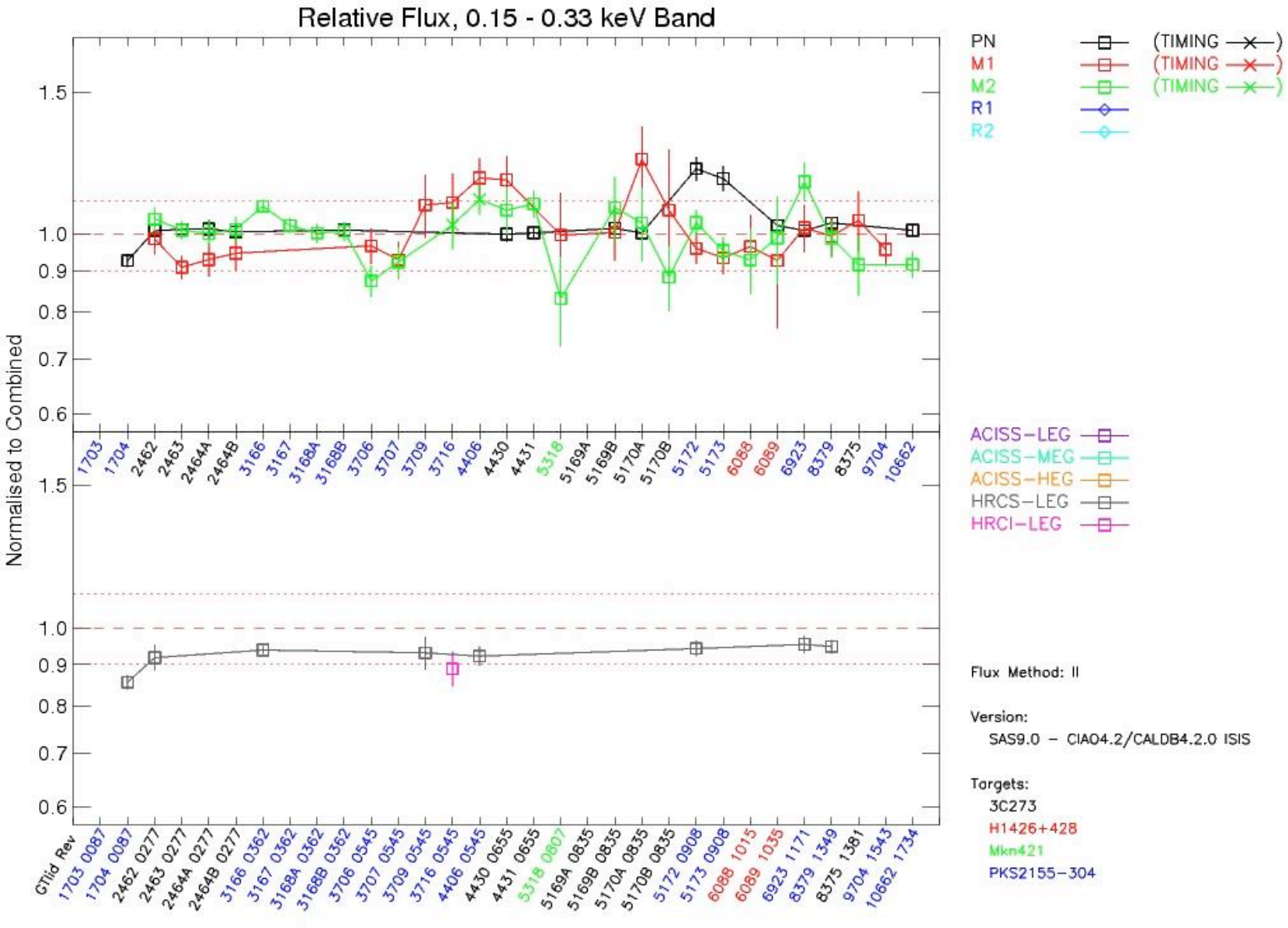
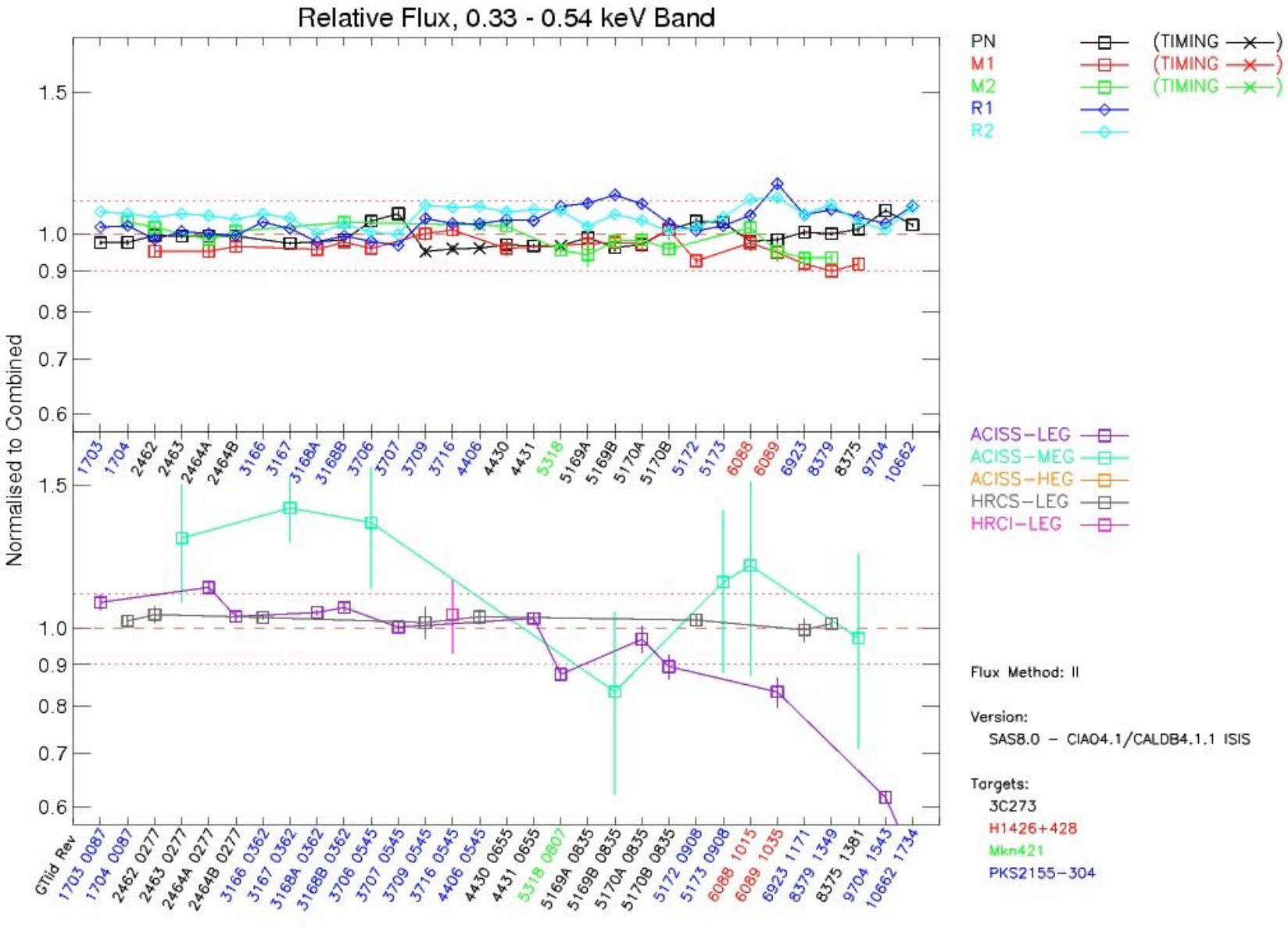
0.15 – 0.33 keV Old



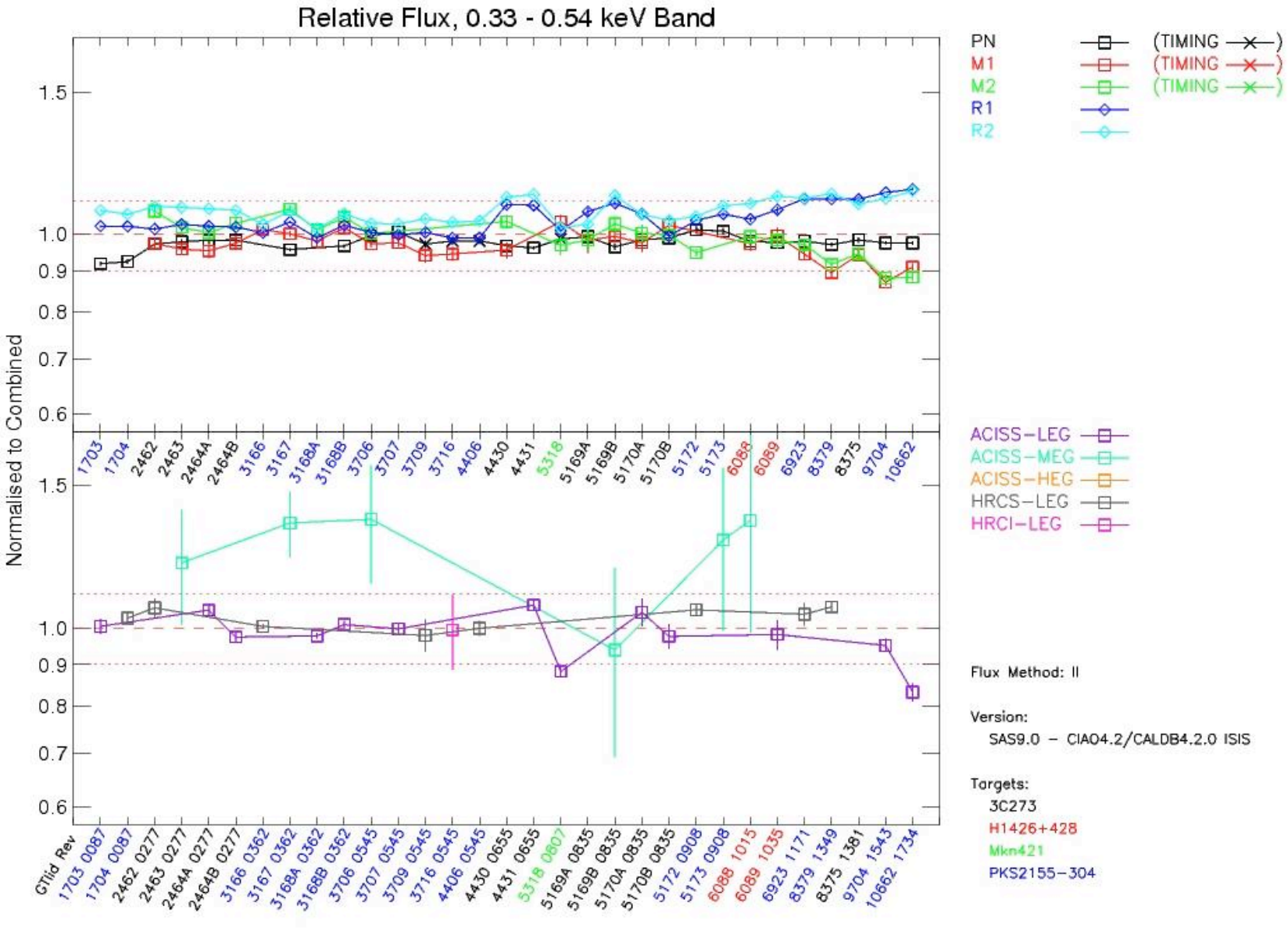
0.15 – 0.33 keV New



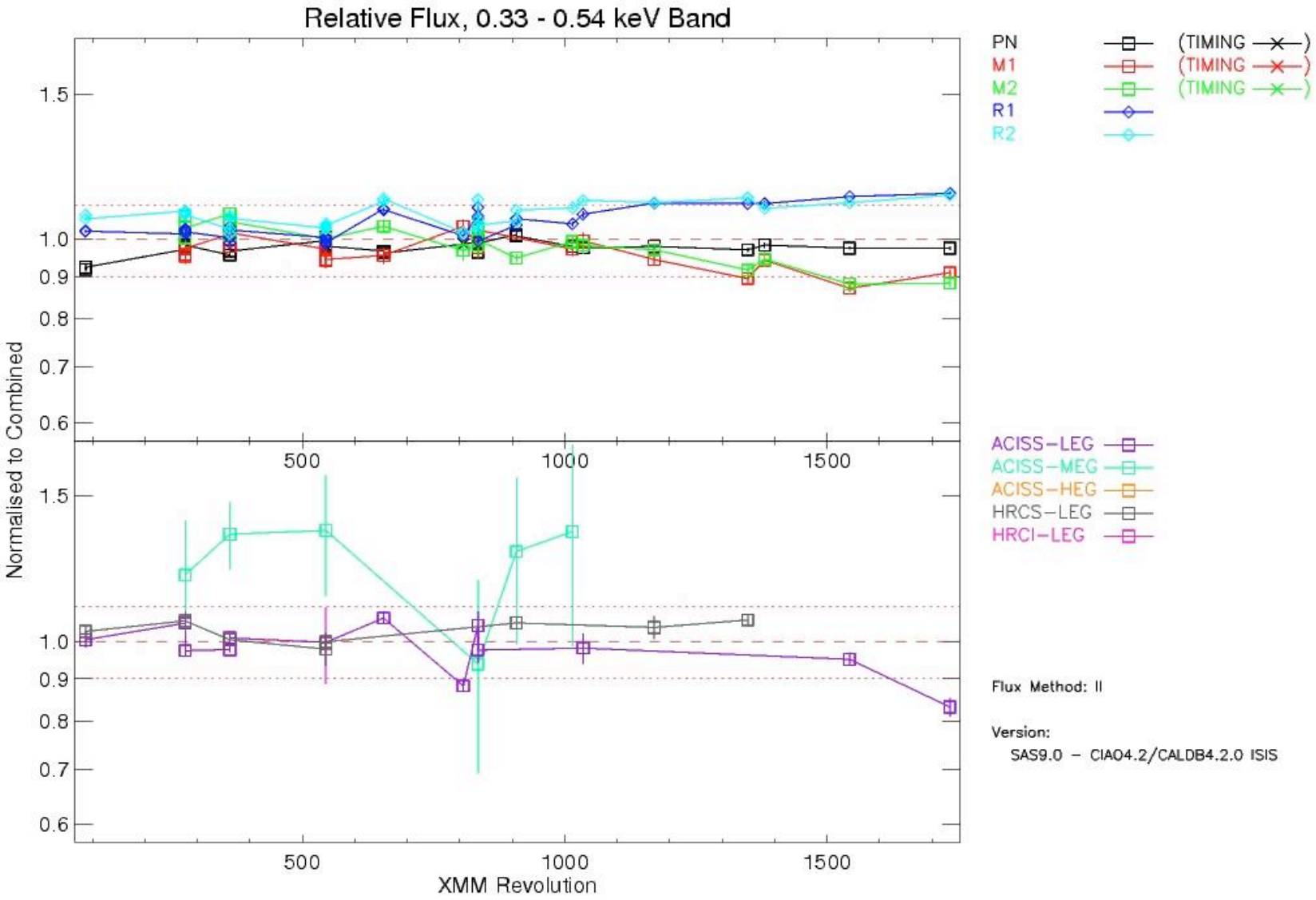
0.33 - 0.54 keV Old



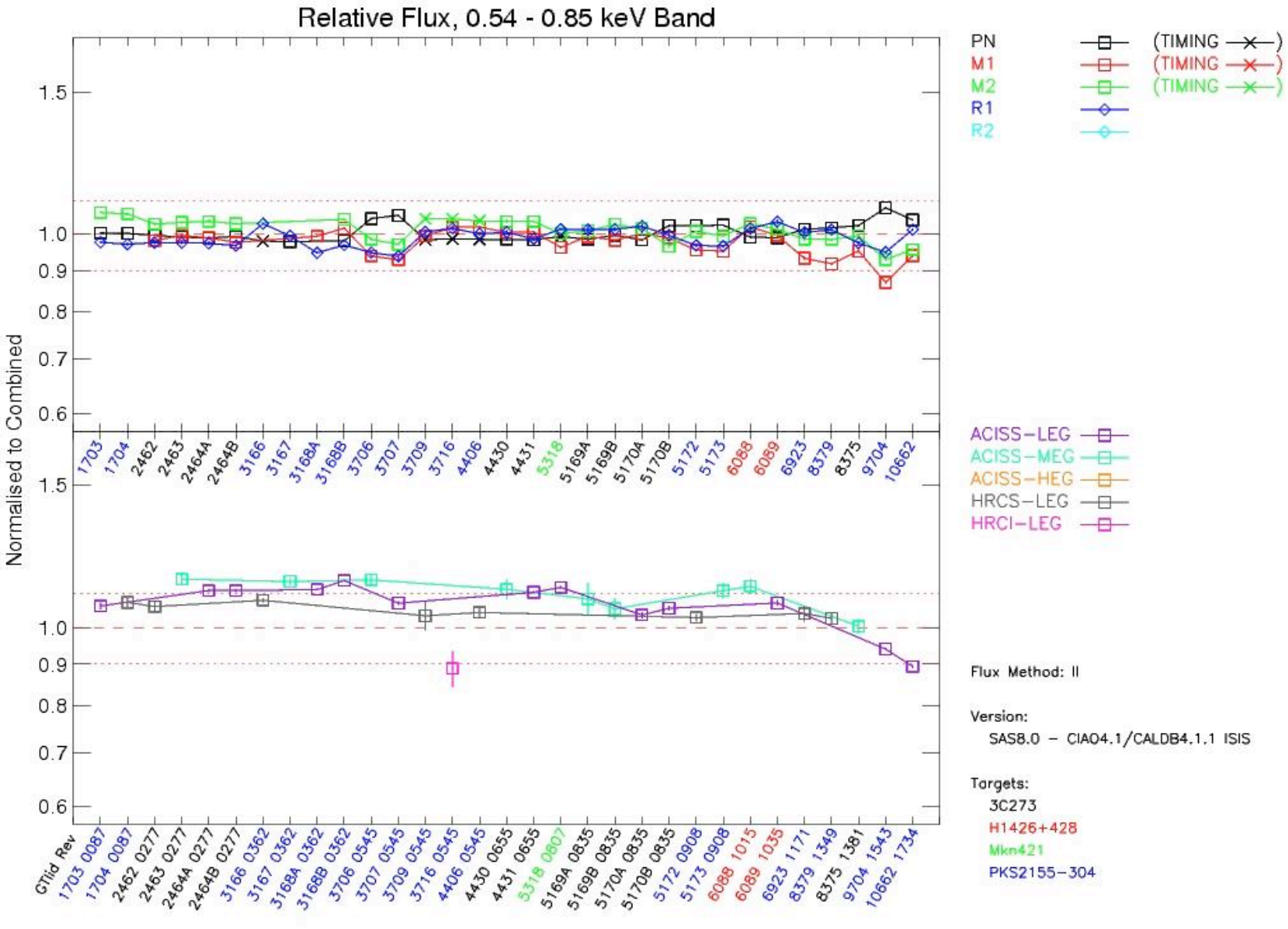
0.33 - 0.54 keV New



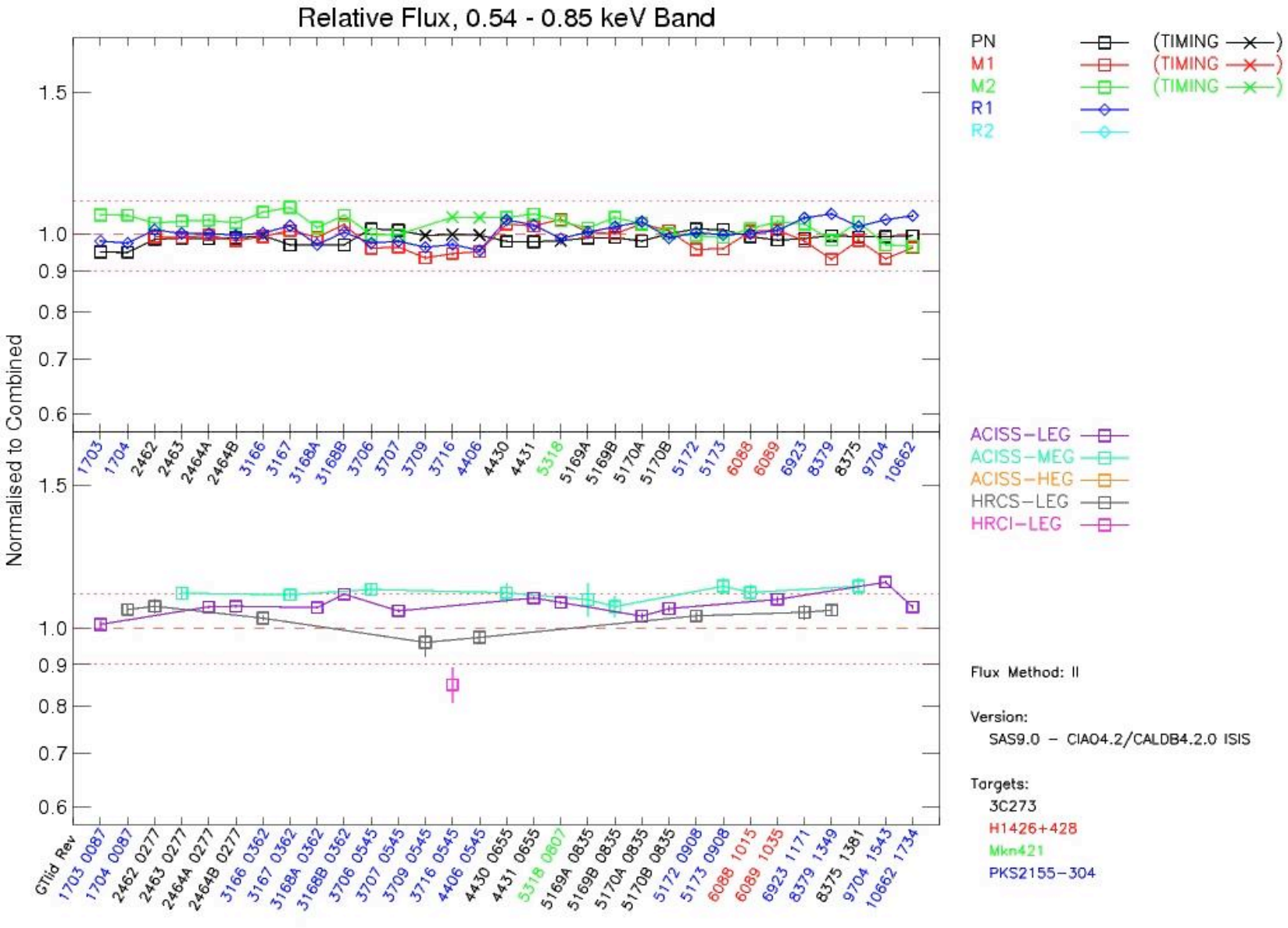
0.33 - 0.54 keV New



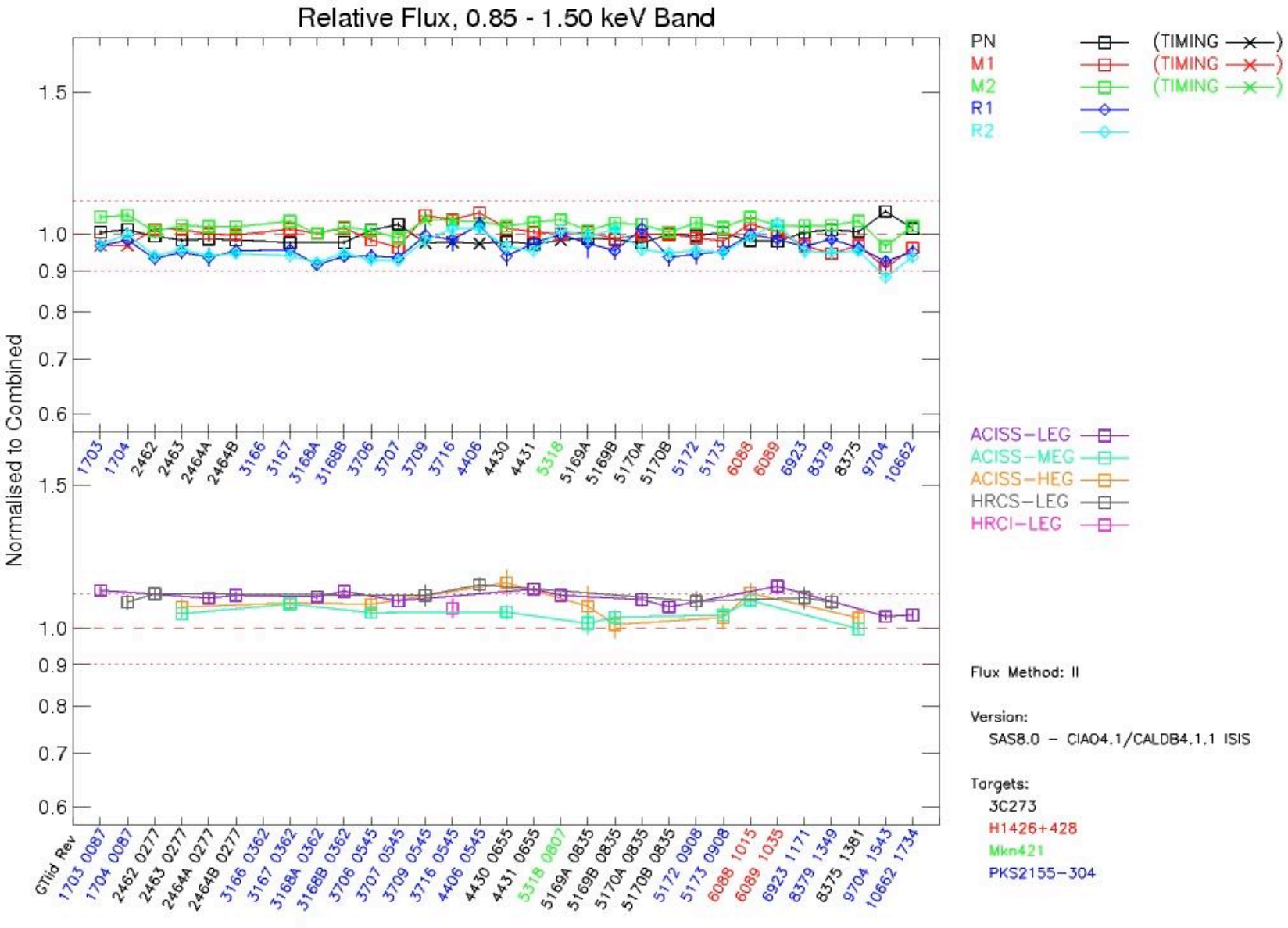
0.54 - 0.85 keV Old



0.54 - 0.85 keV New



0.85 - 1.50 keV Old



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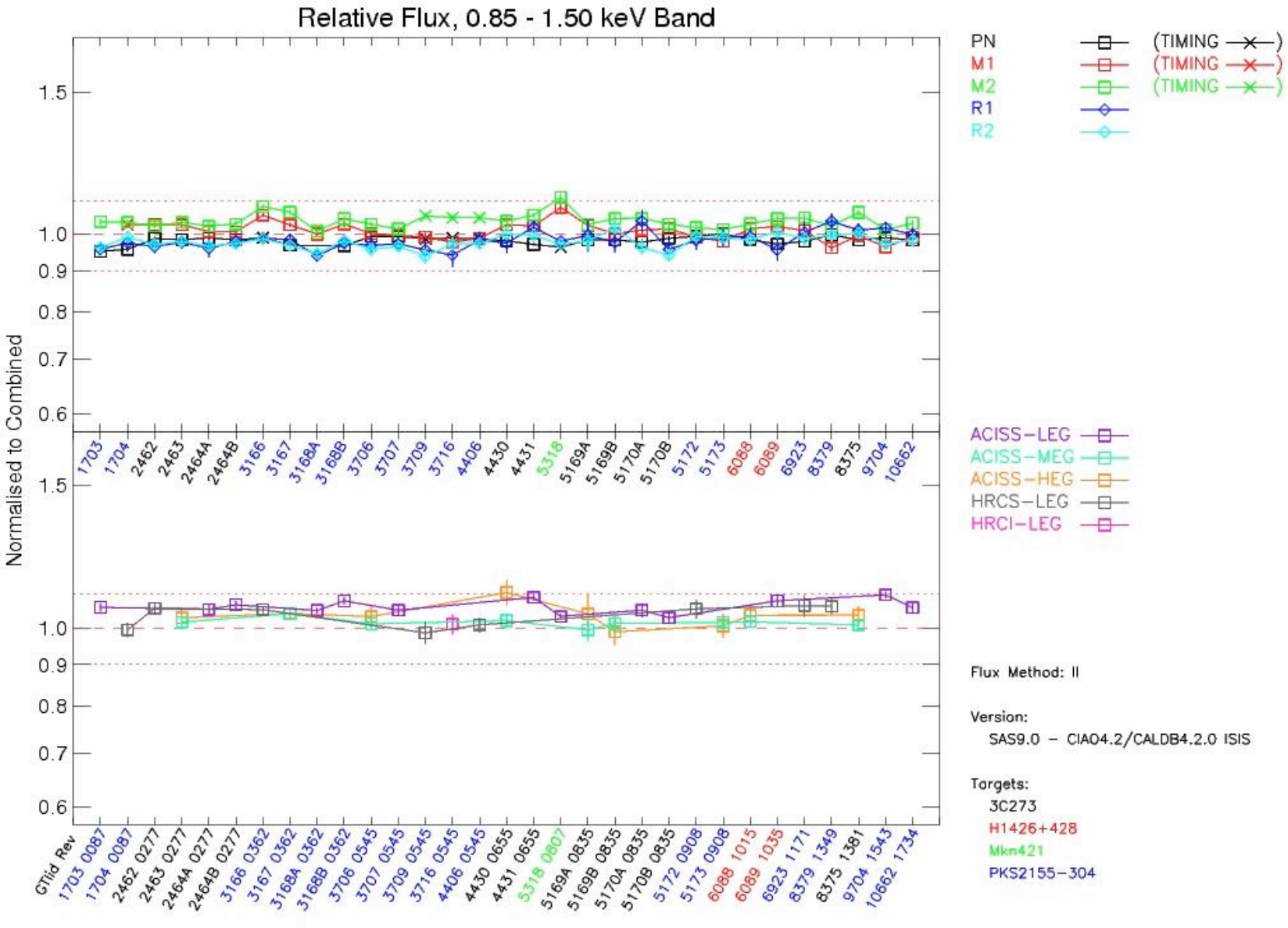
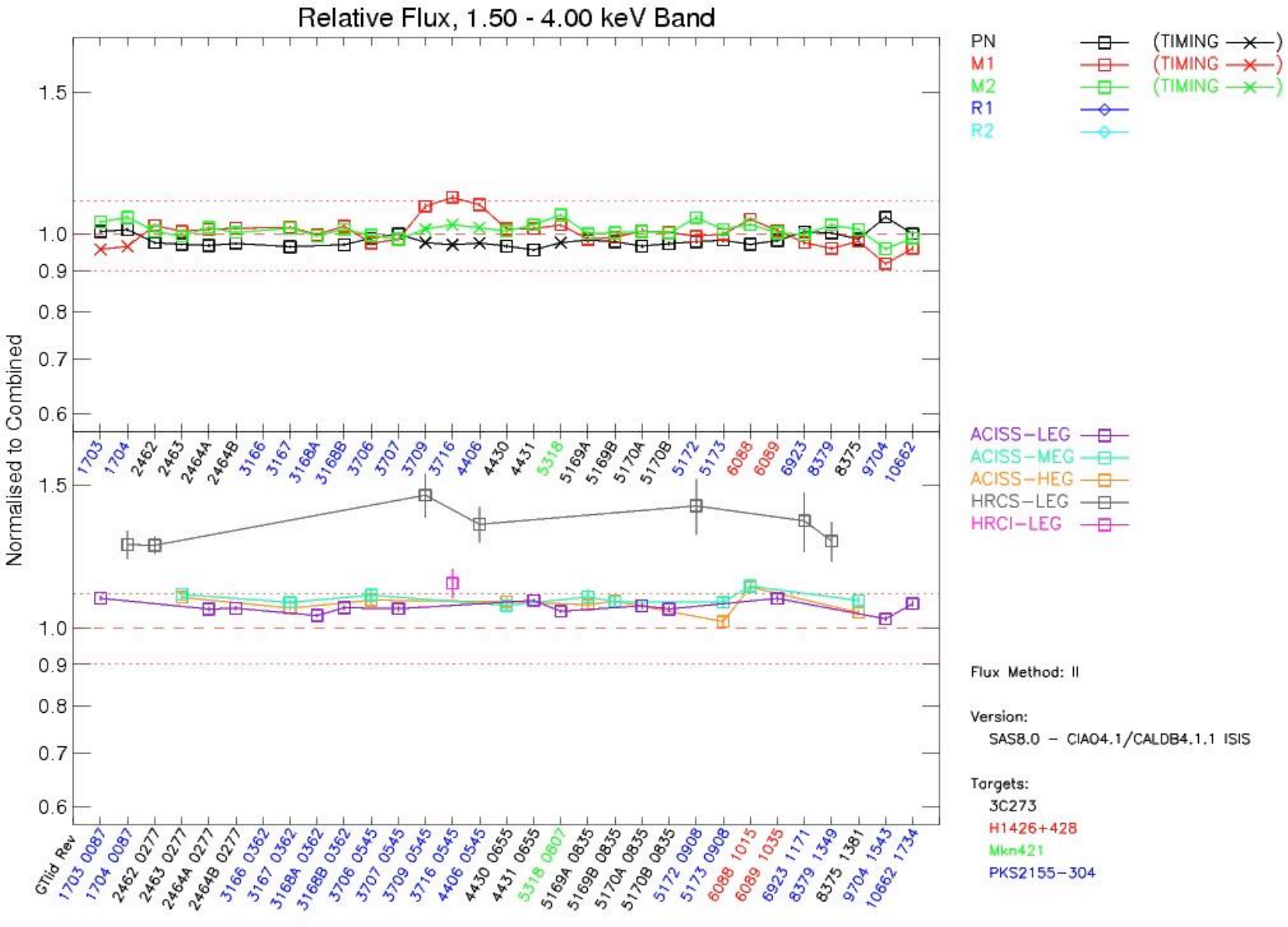
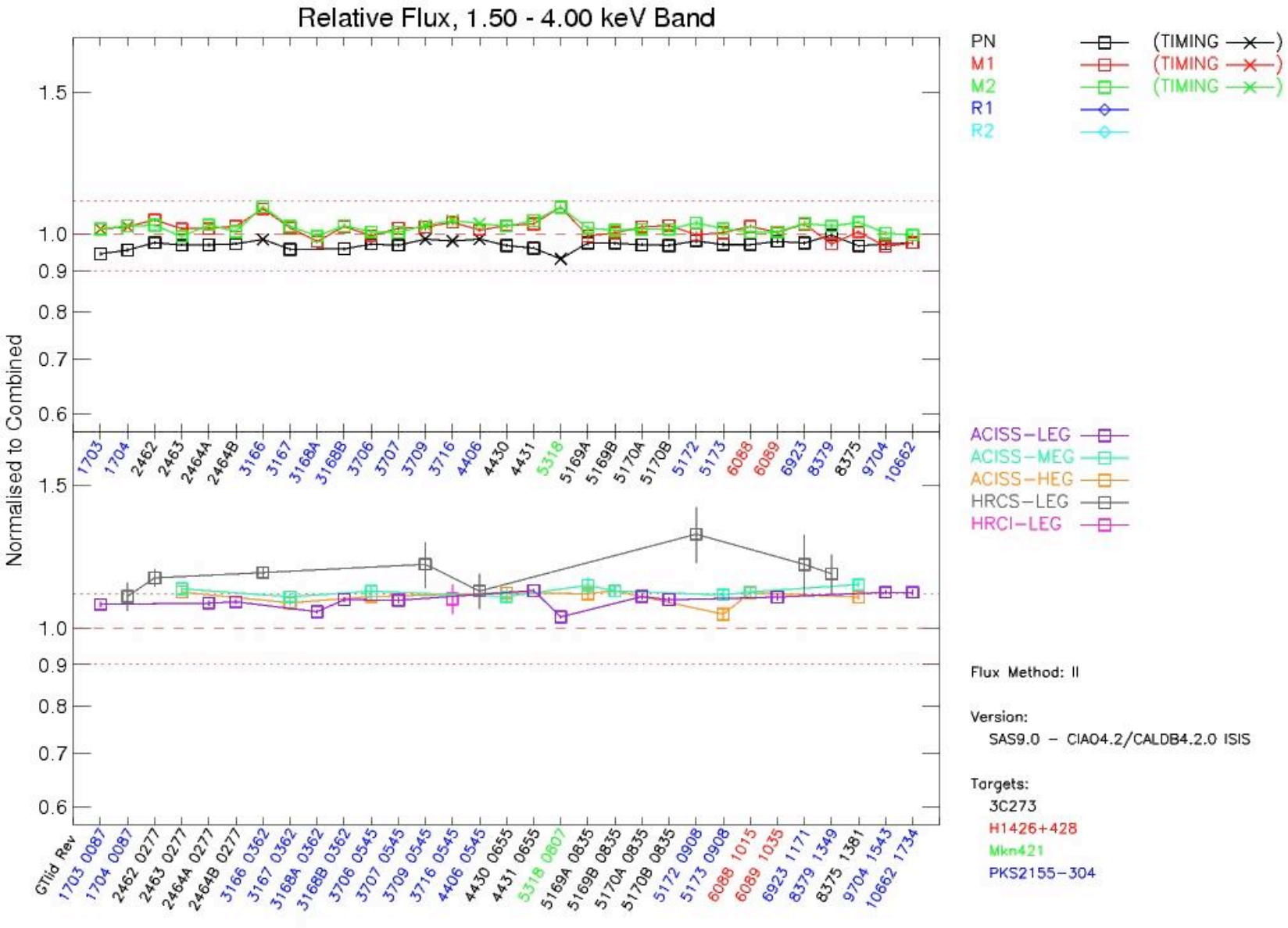


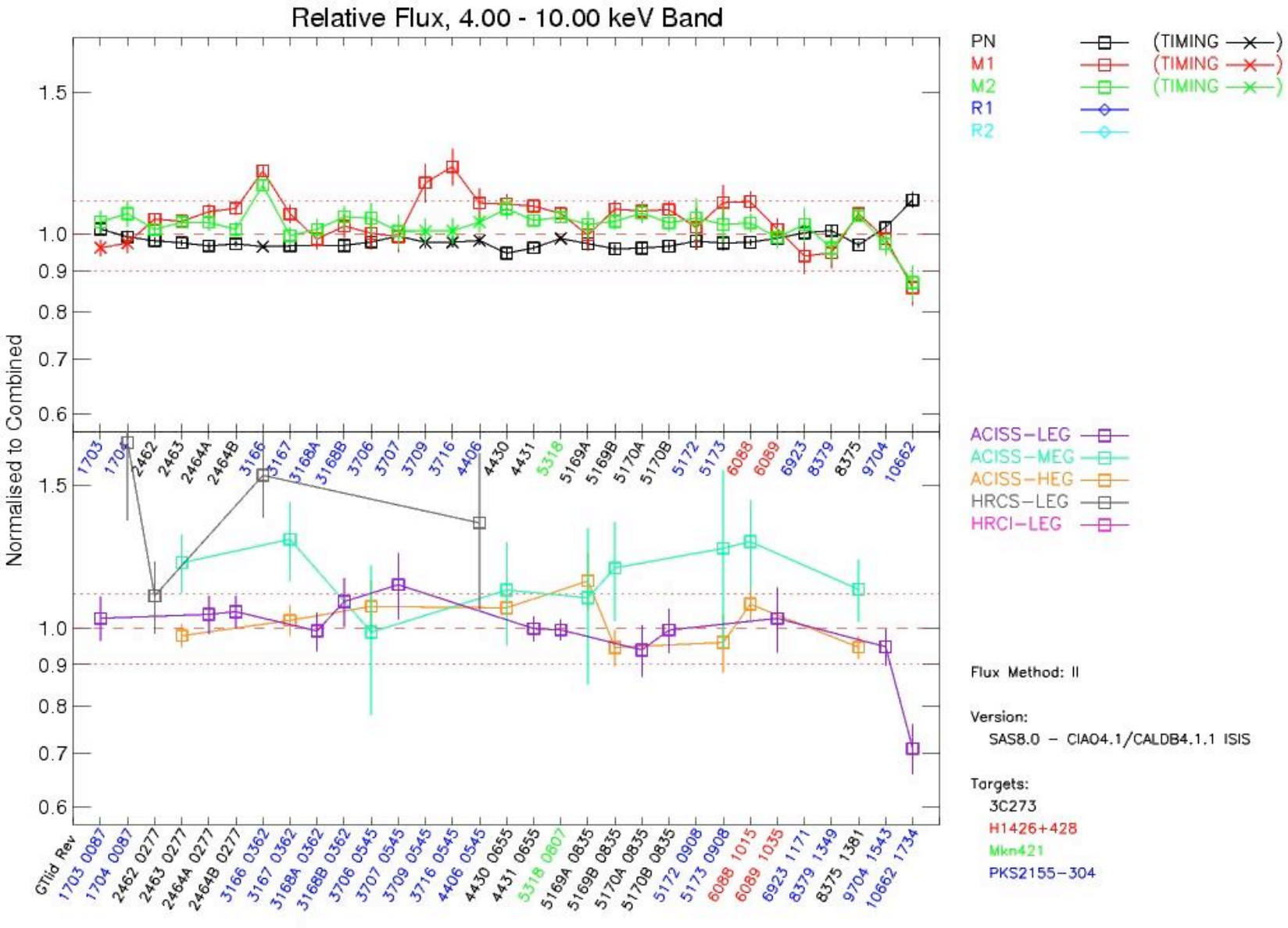
1.50 - 4.00 keV Old



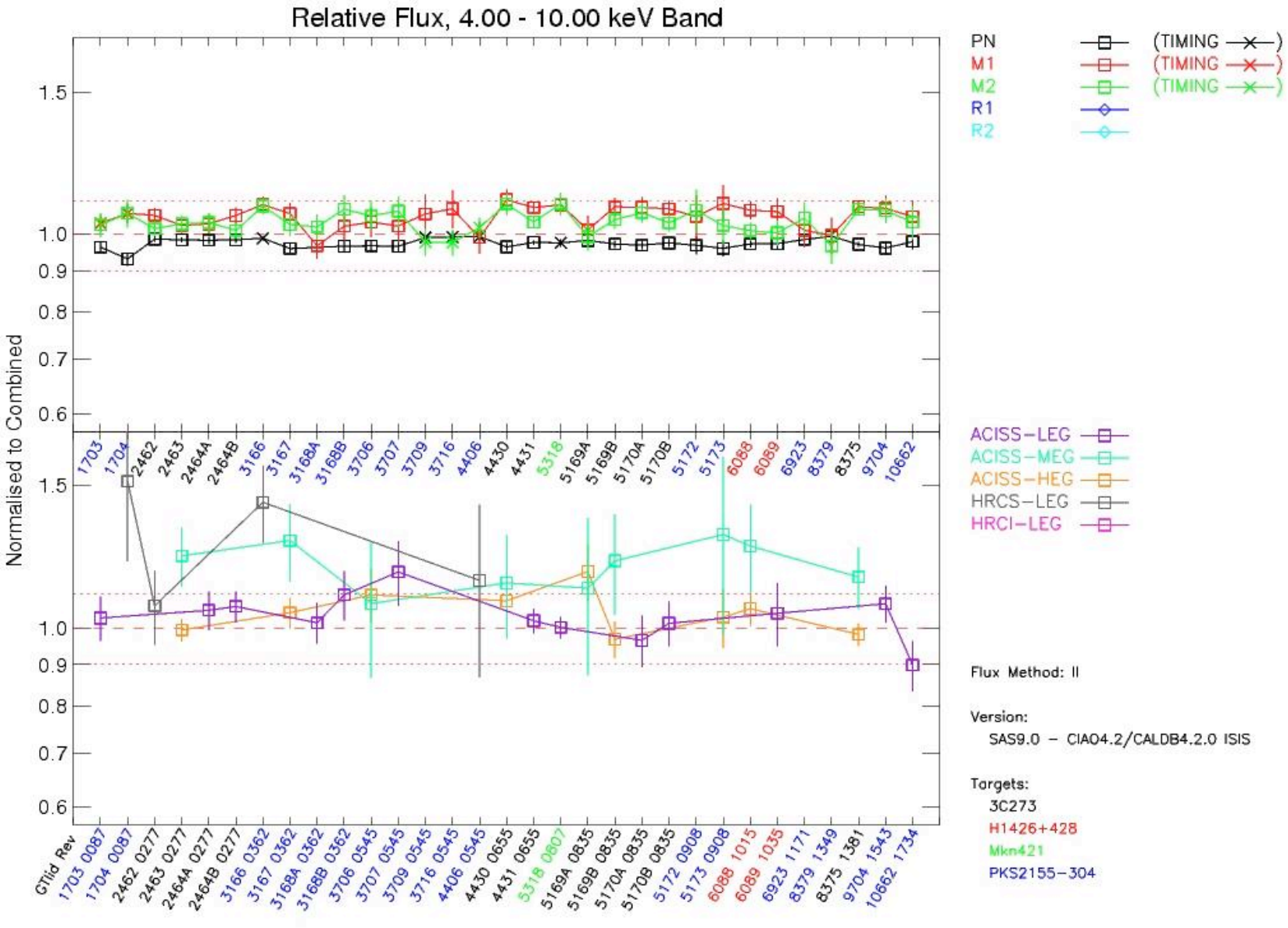
1.50 - 4.00 keV New



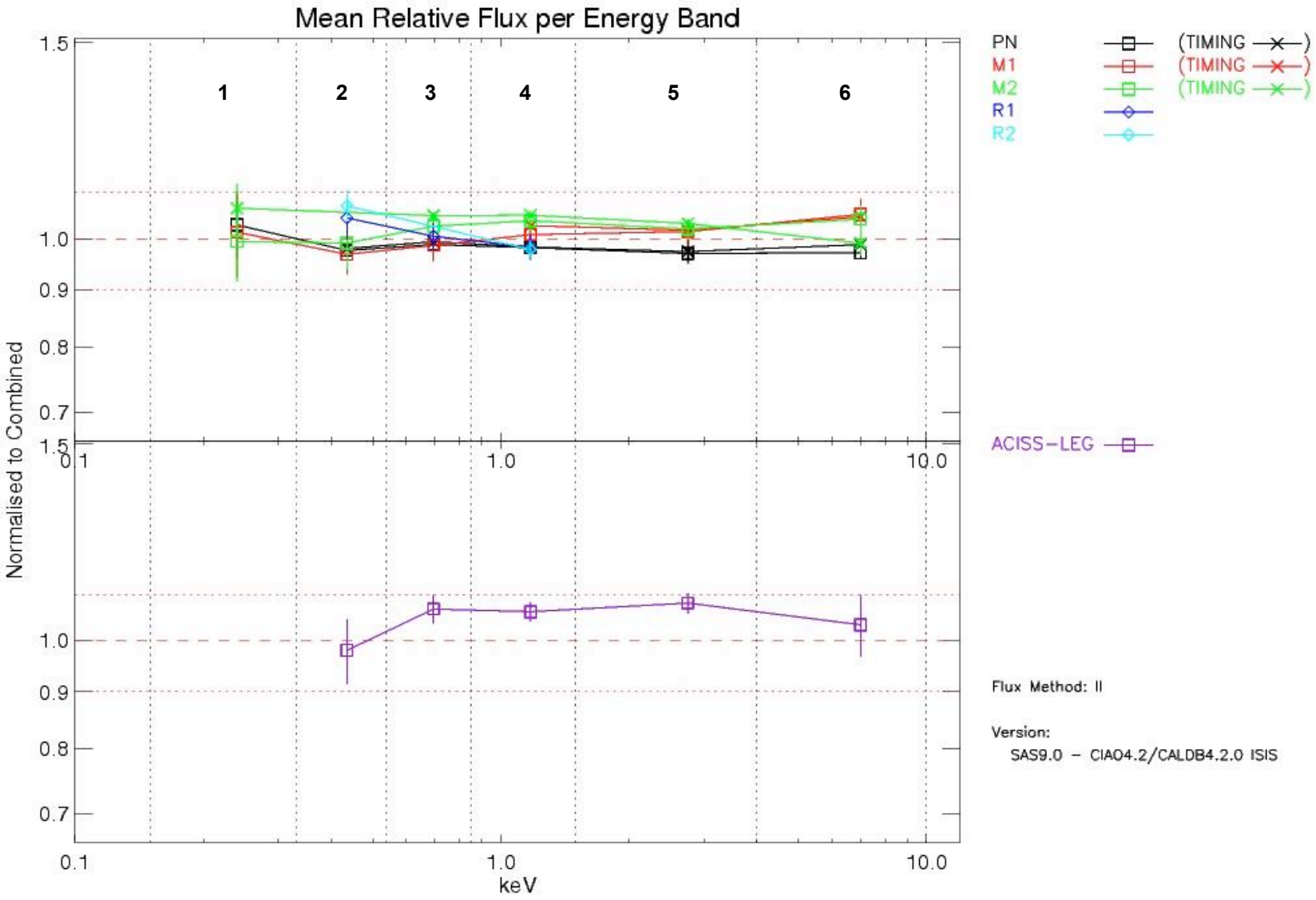
4.00 – 10.0 keV Old



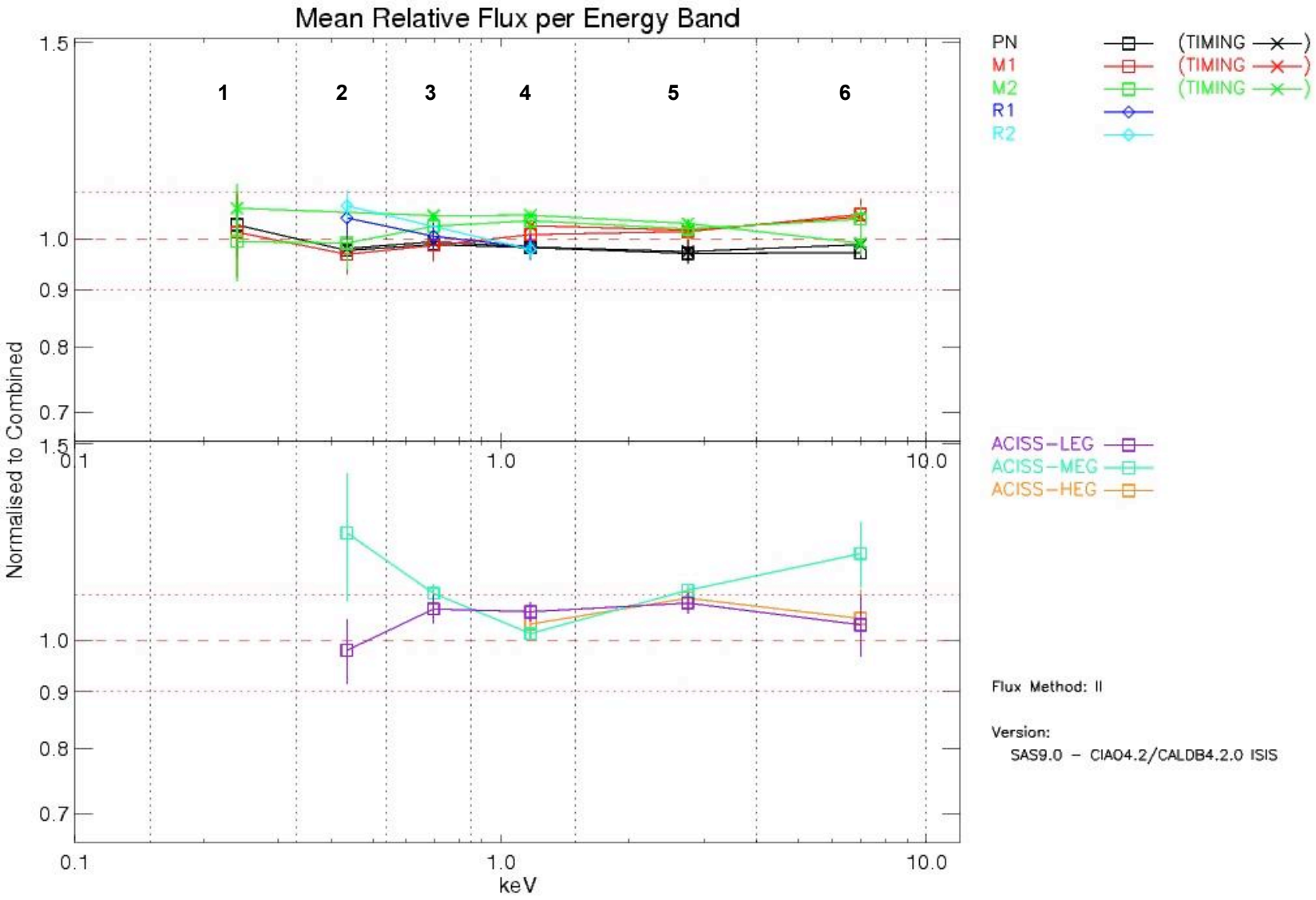
4.00 - 10.0 keV New



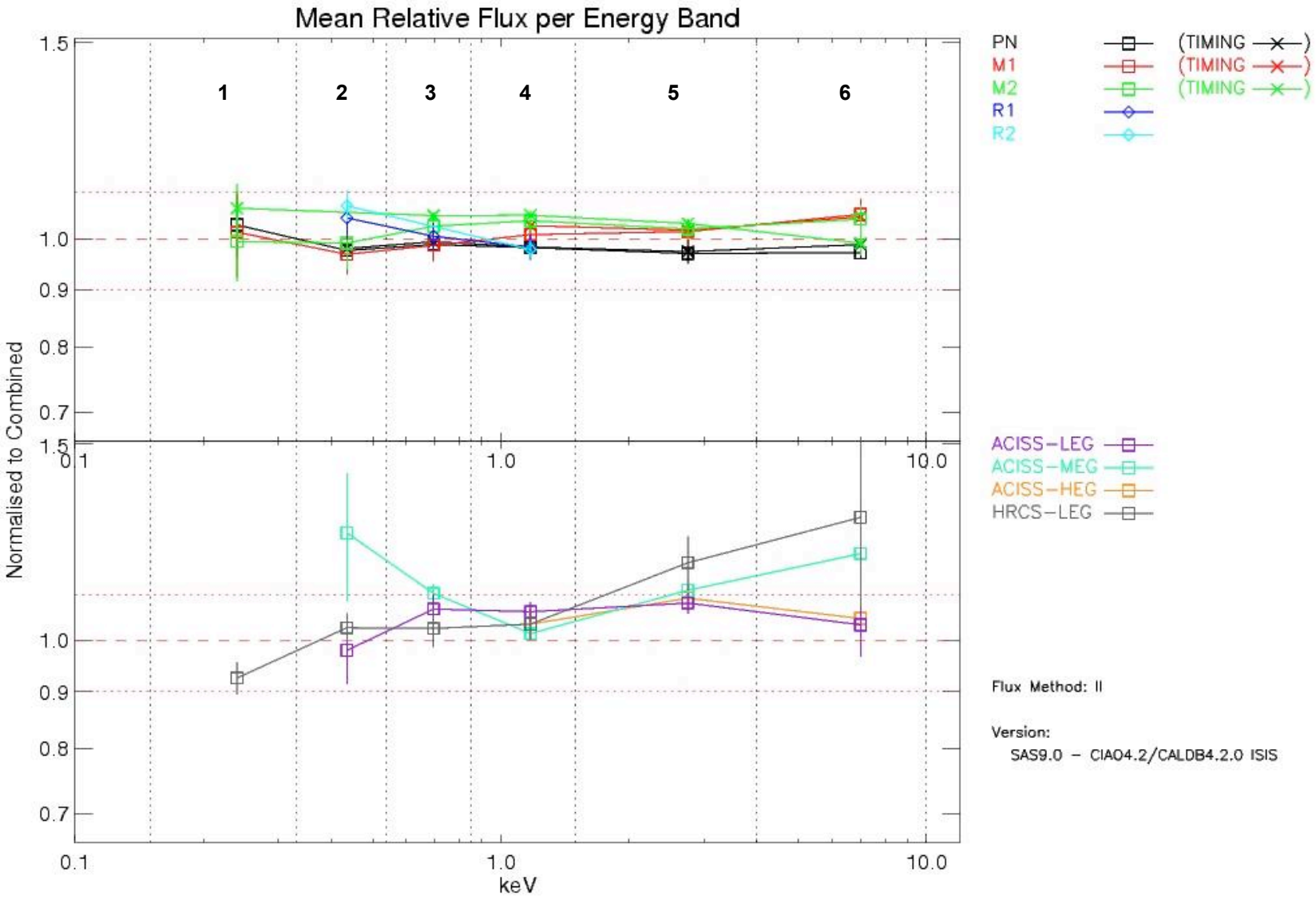
Mean Relative Flux



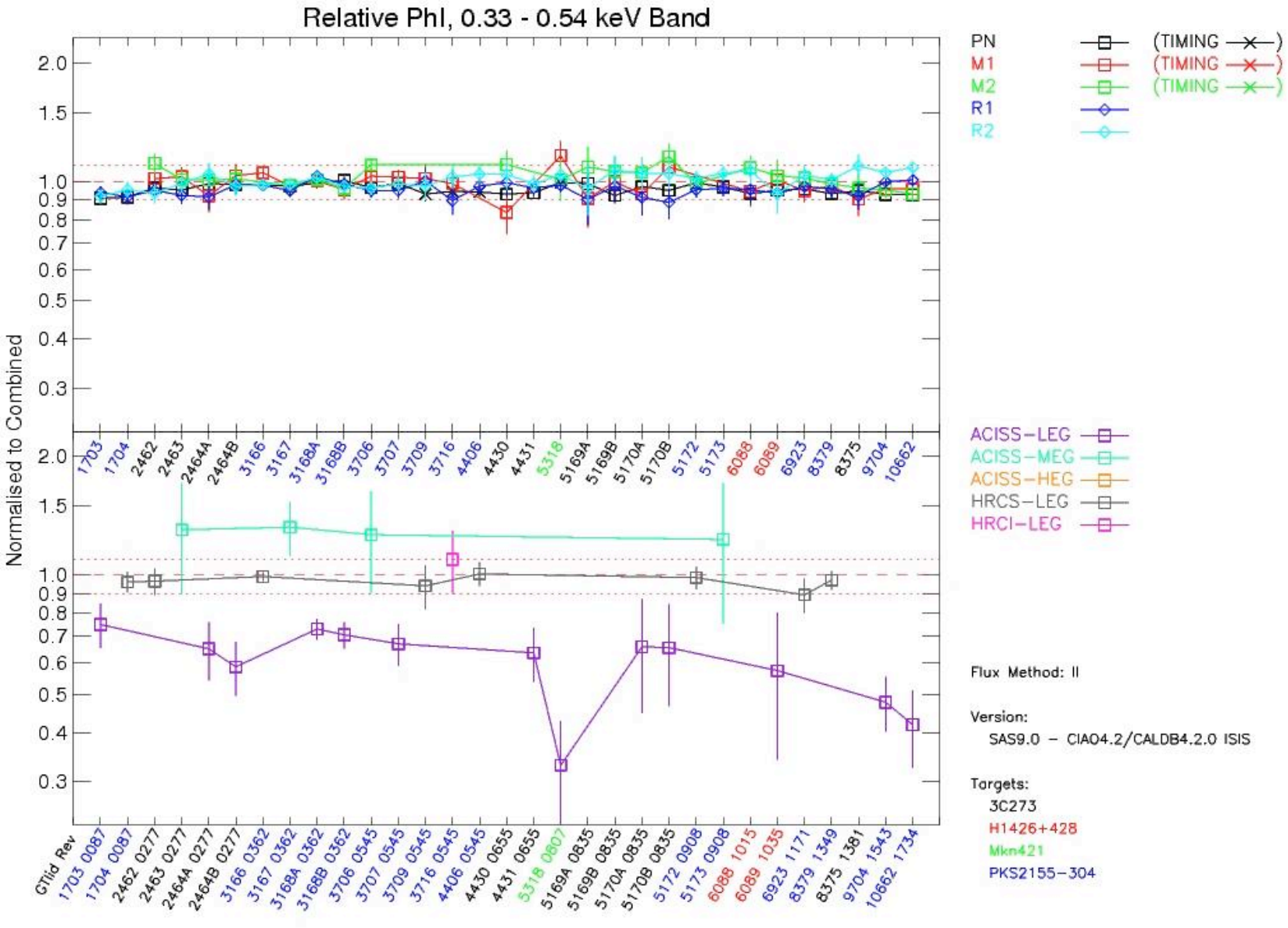
Mean Relative Flux



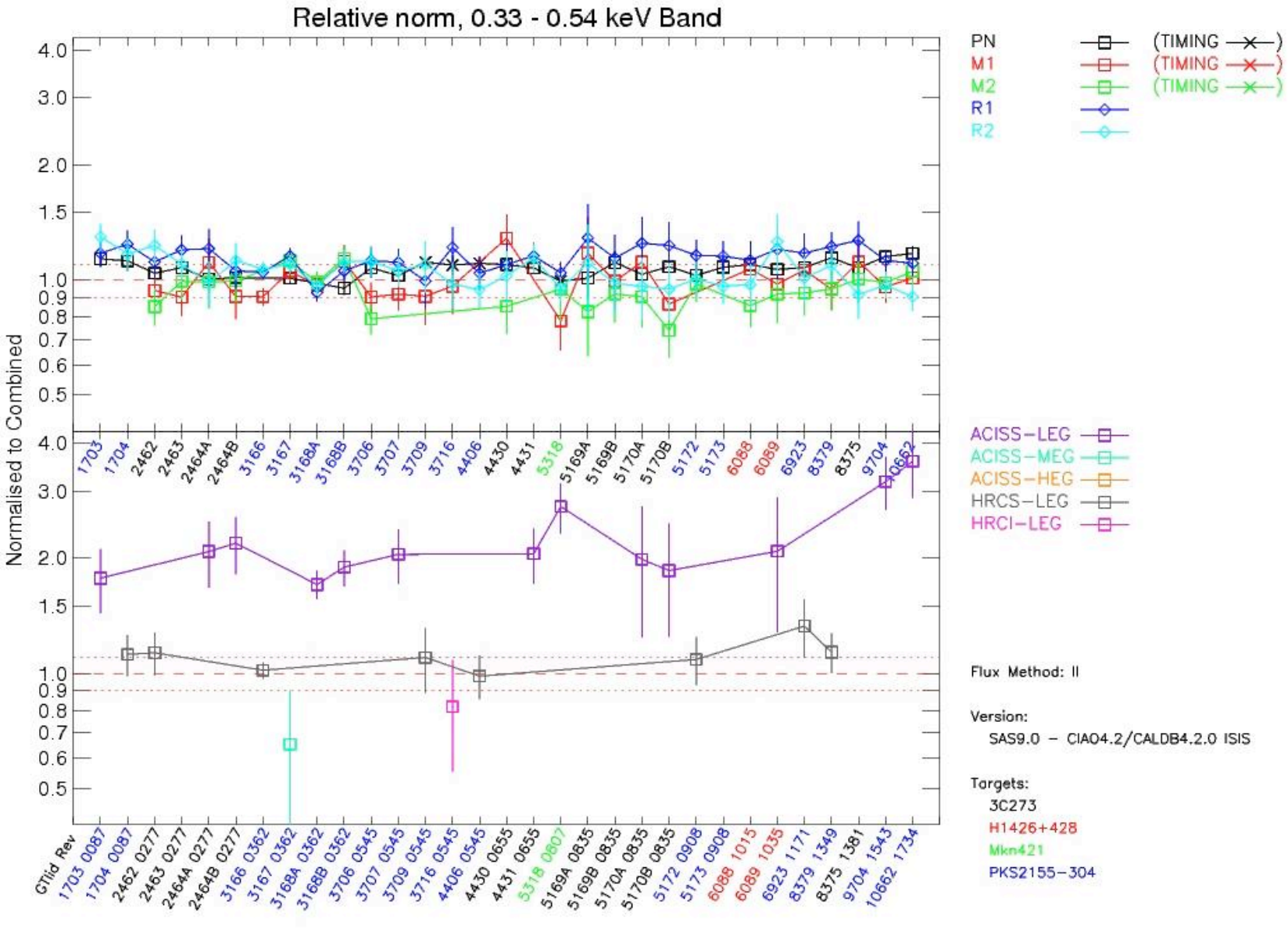
Mean Relative Flux



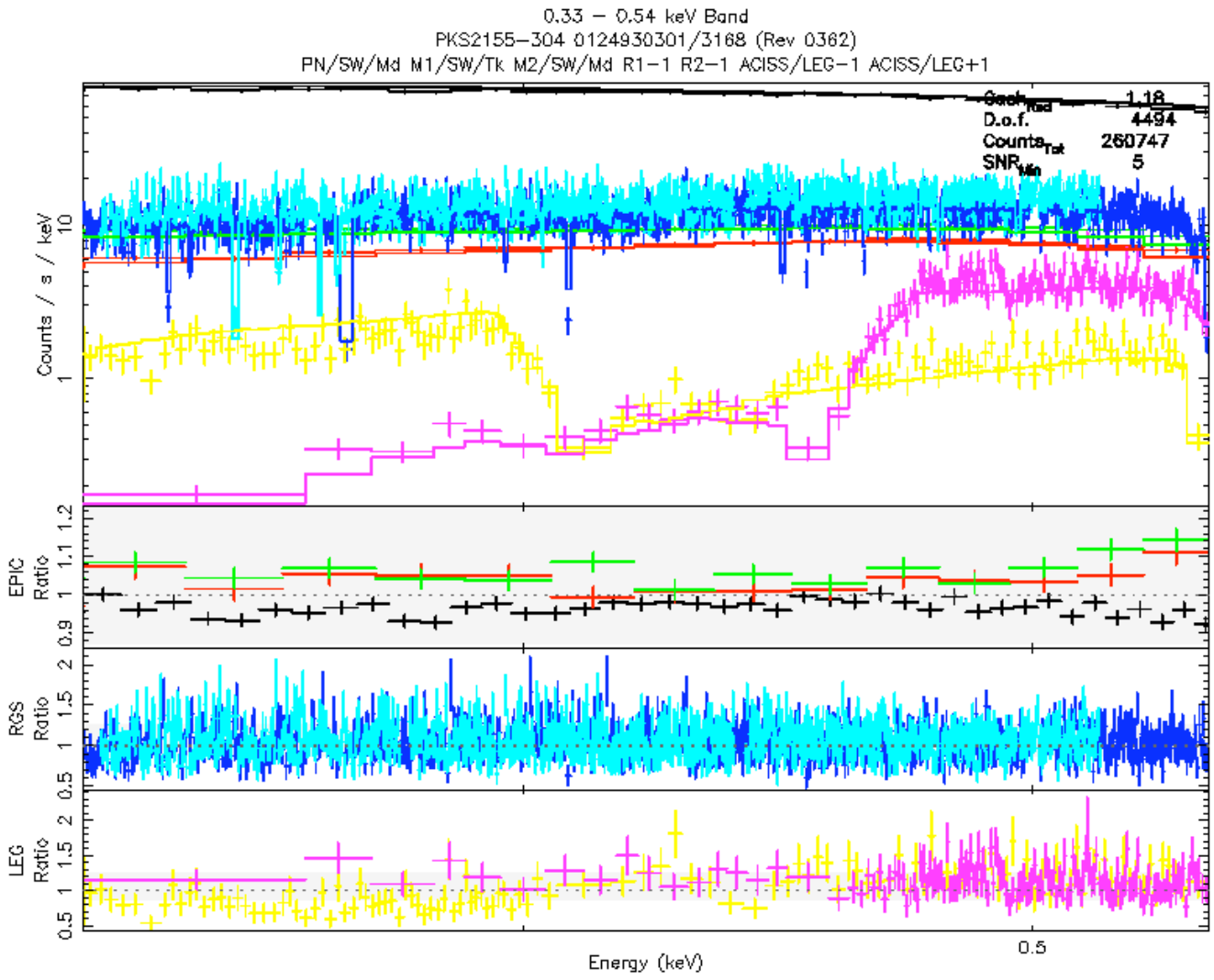
ACIS-S Spectra in 0.33-0.54 keV (I)



ACIS-S Spectra in 0.33-0.54 keV (II)



ACIS-S Spectra in 0.33-0.54 keV (III)



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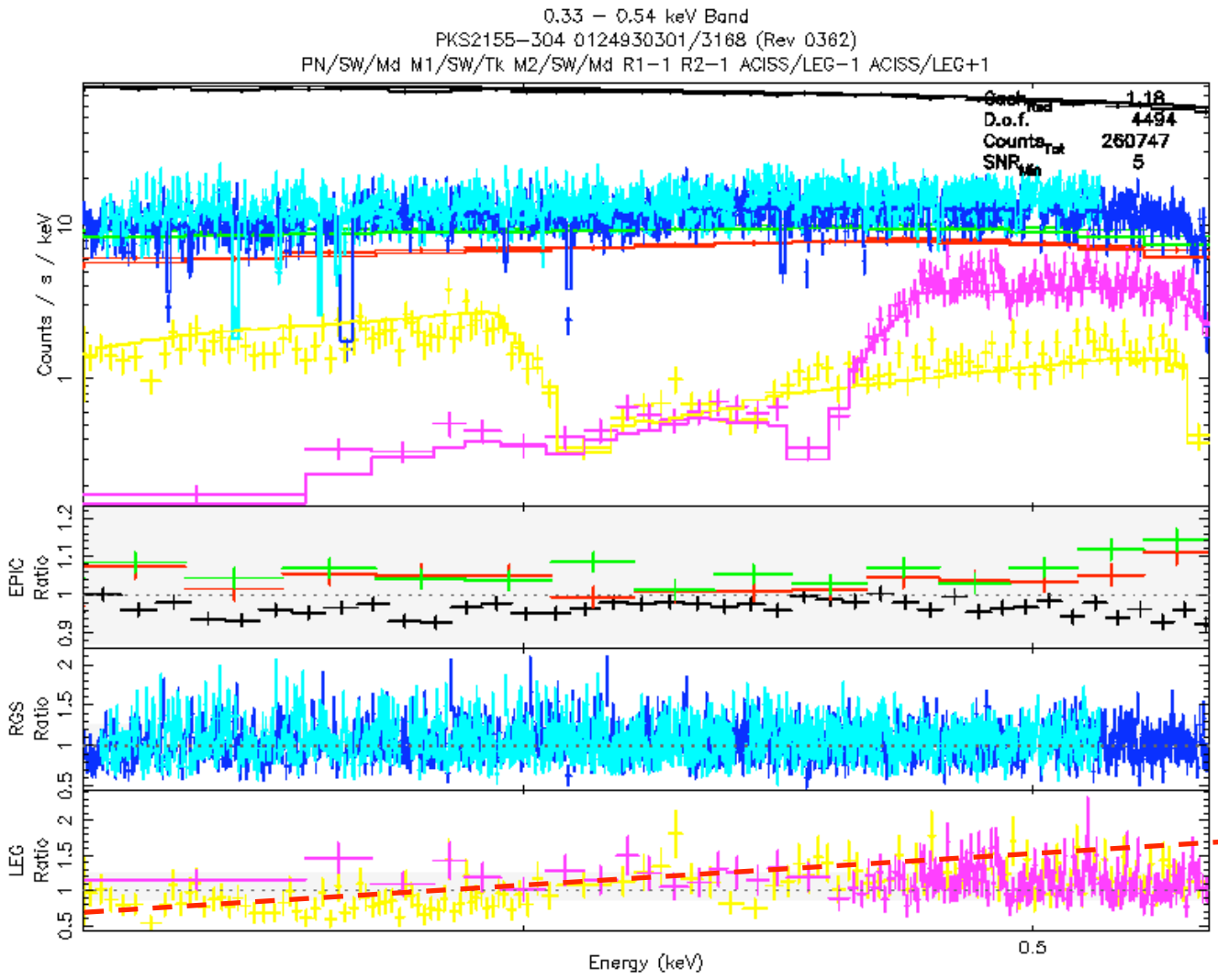

-1 Order

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HRC-S LETG

Huge improvement with new Chandra calibration;
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ACIS-S LETG & HETG

Above 0.54 keV, an excess of 0 - 10% w.r.t. PN, better agreement with MOS fluxes.