

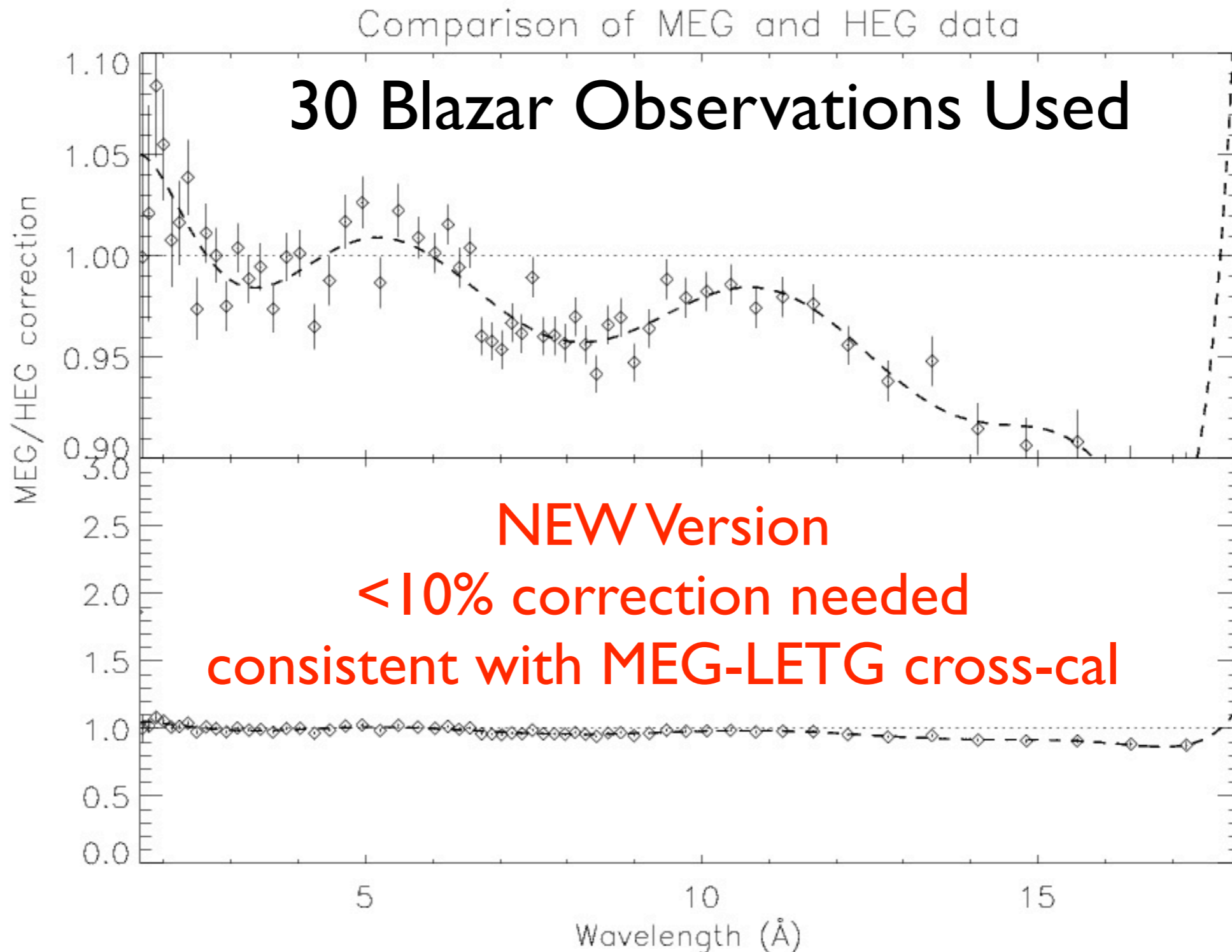
Updating the HETGS Grating Efficiencies

Herman Marshall
Nov. 22, 2011

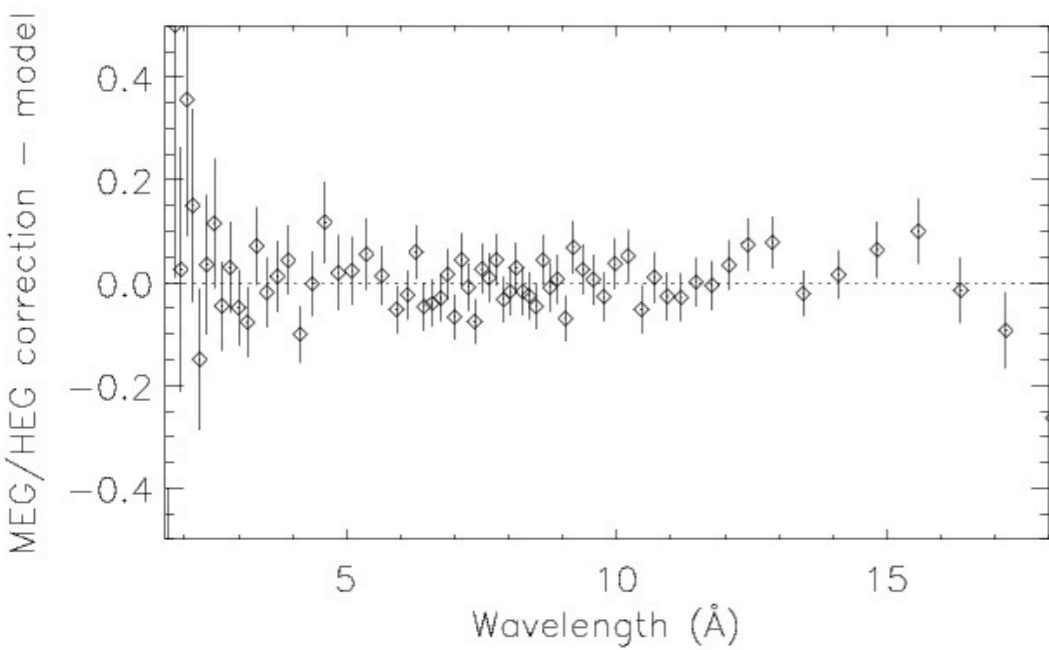
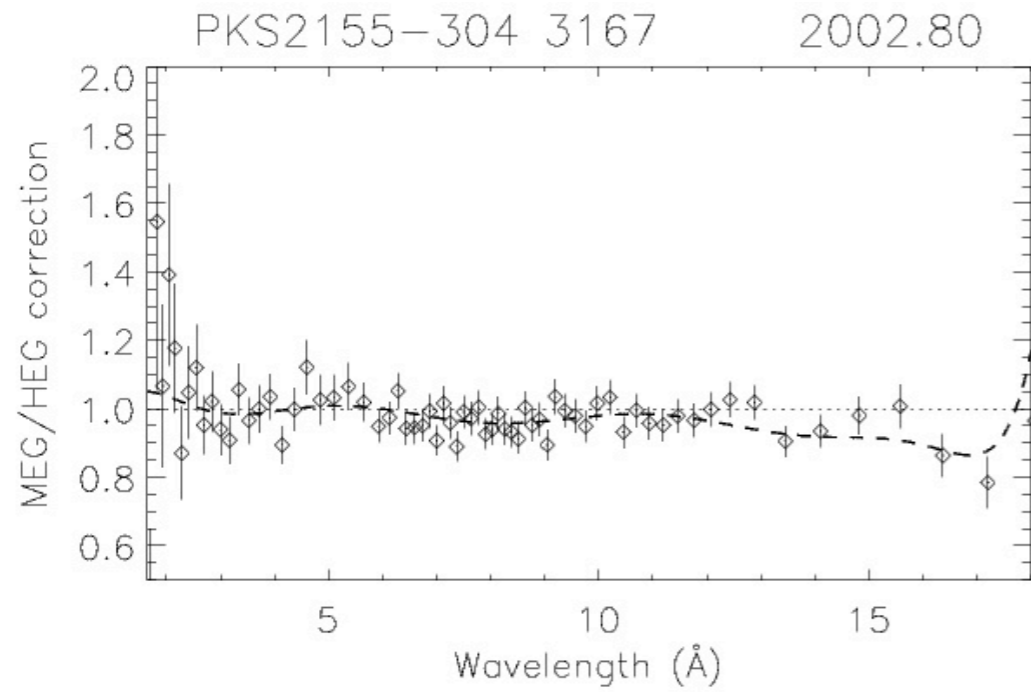
F MINUS by Tony Carrillo



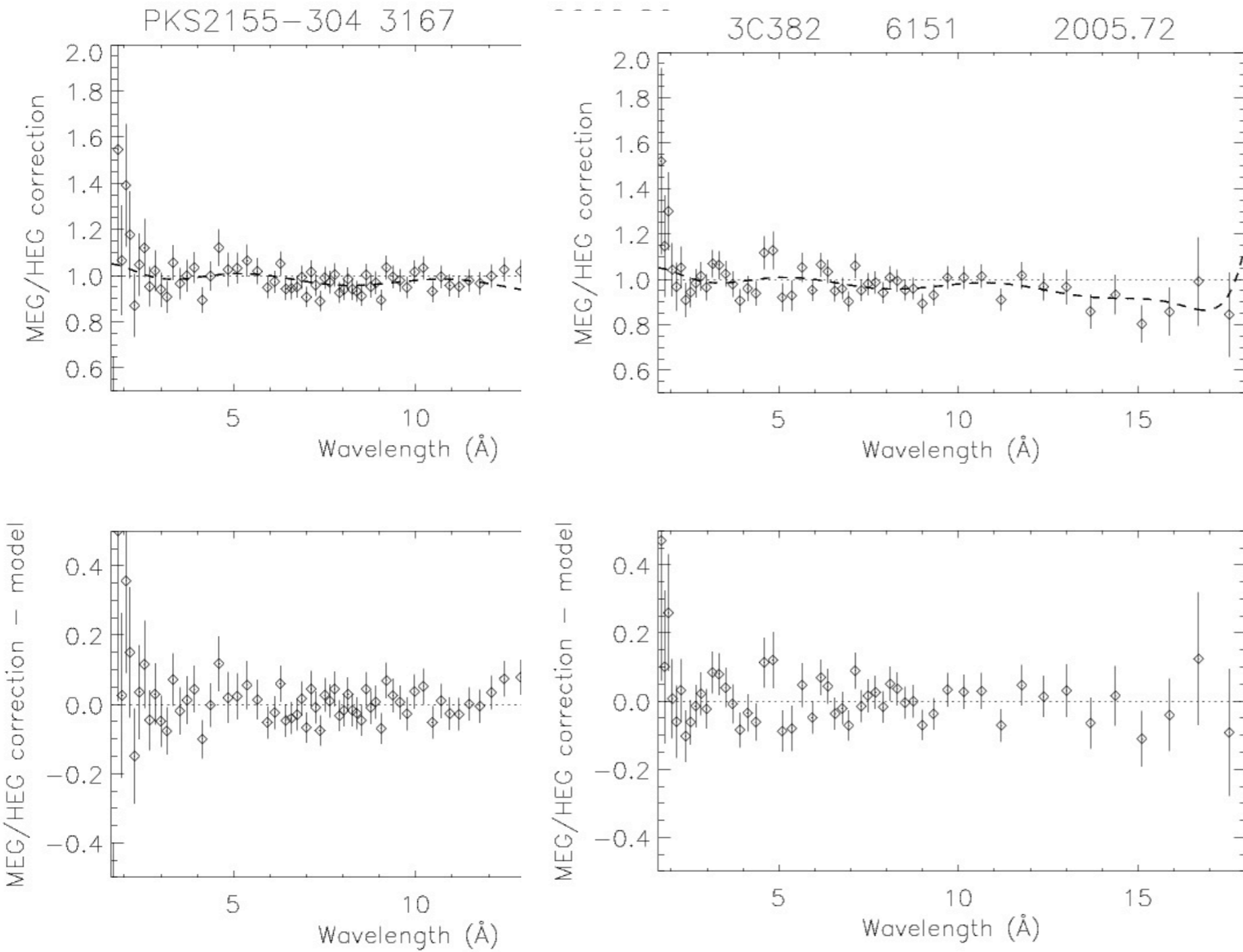
HEG-MEG Comparison



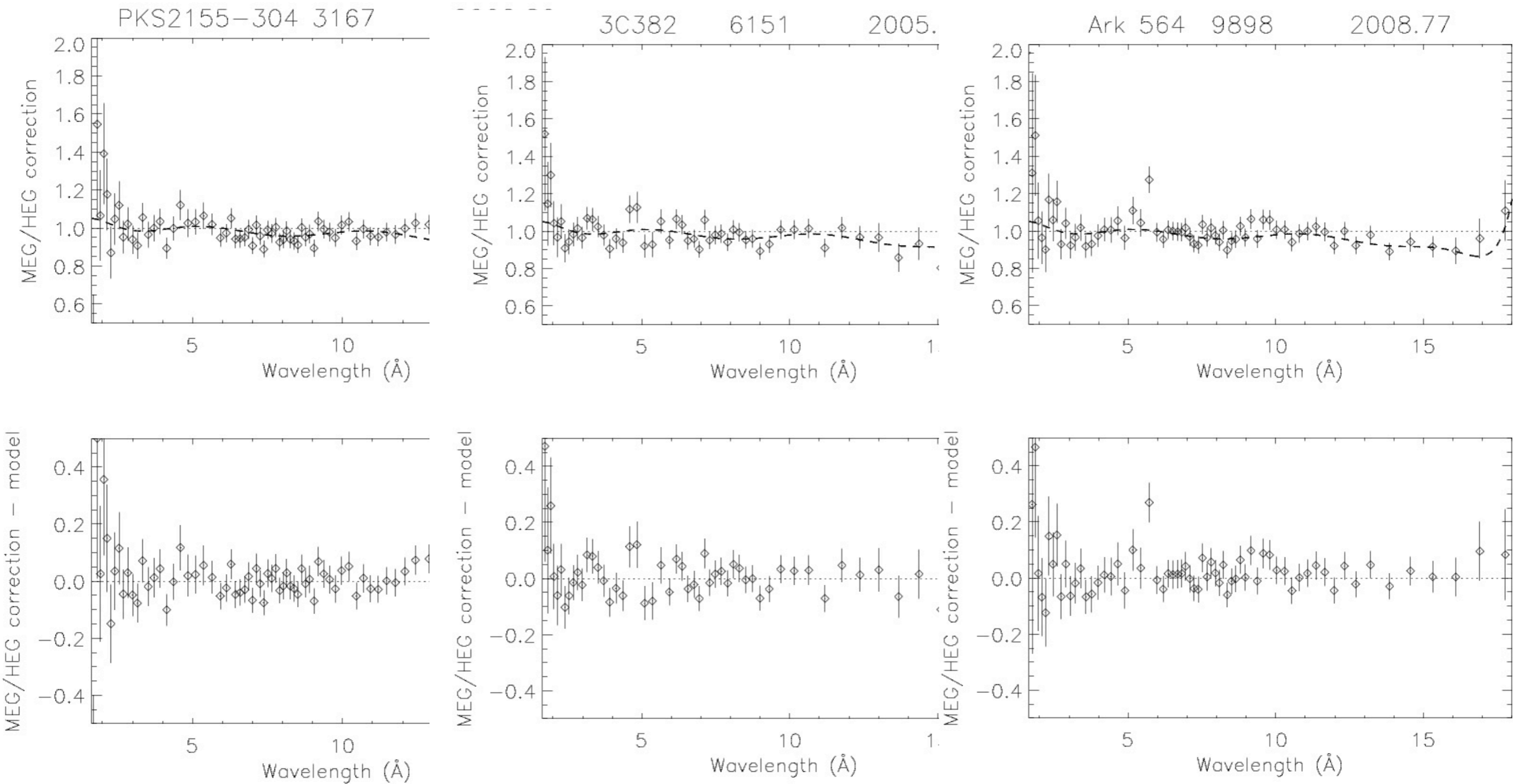
Correcting HETGS Ratio



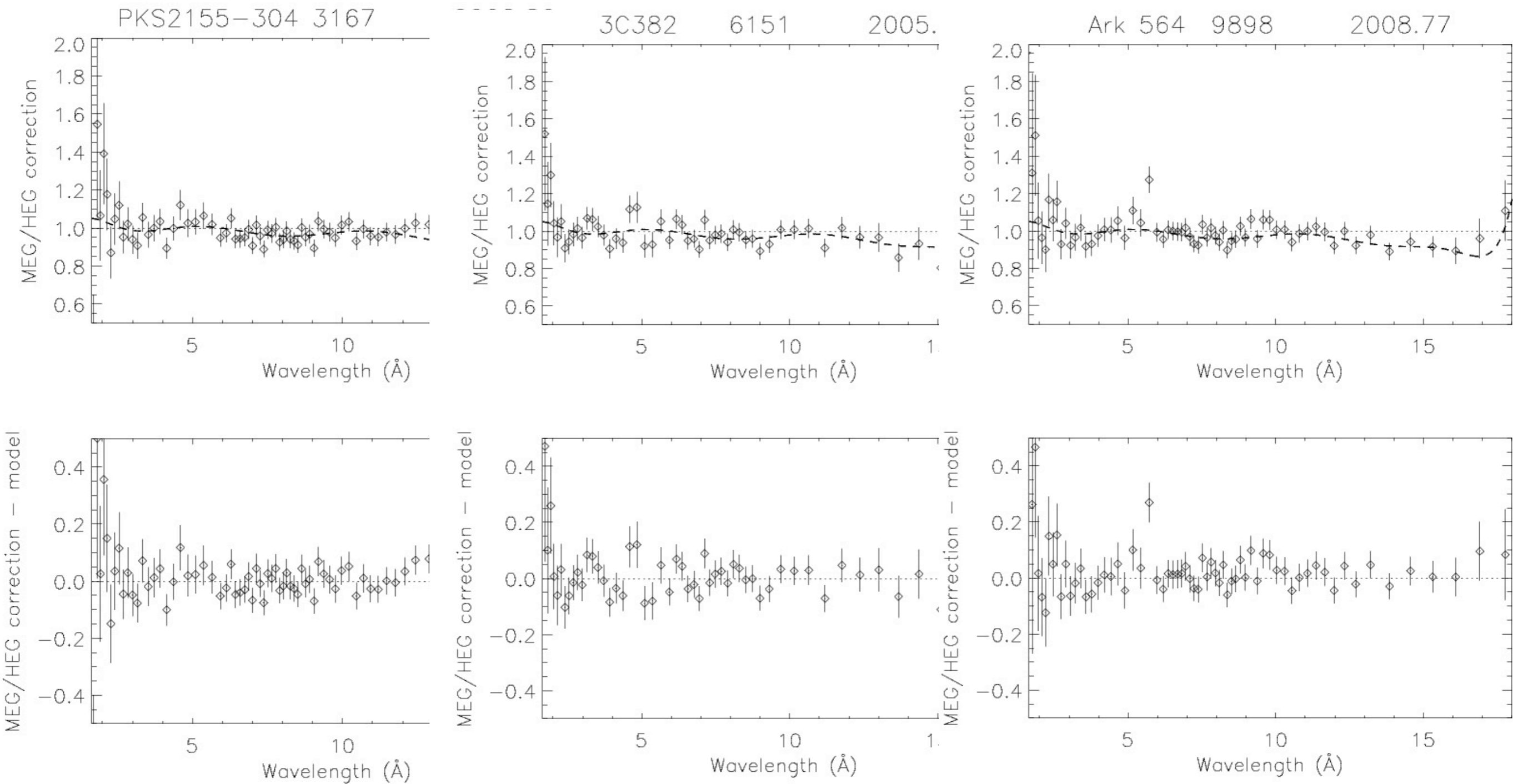
Correcting HETGS Ratio



Correcting HETGS Ratio



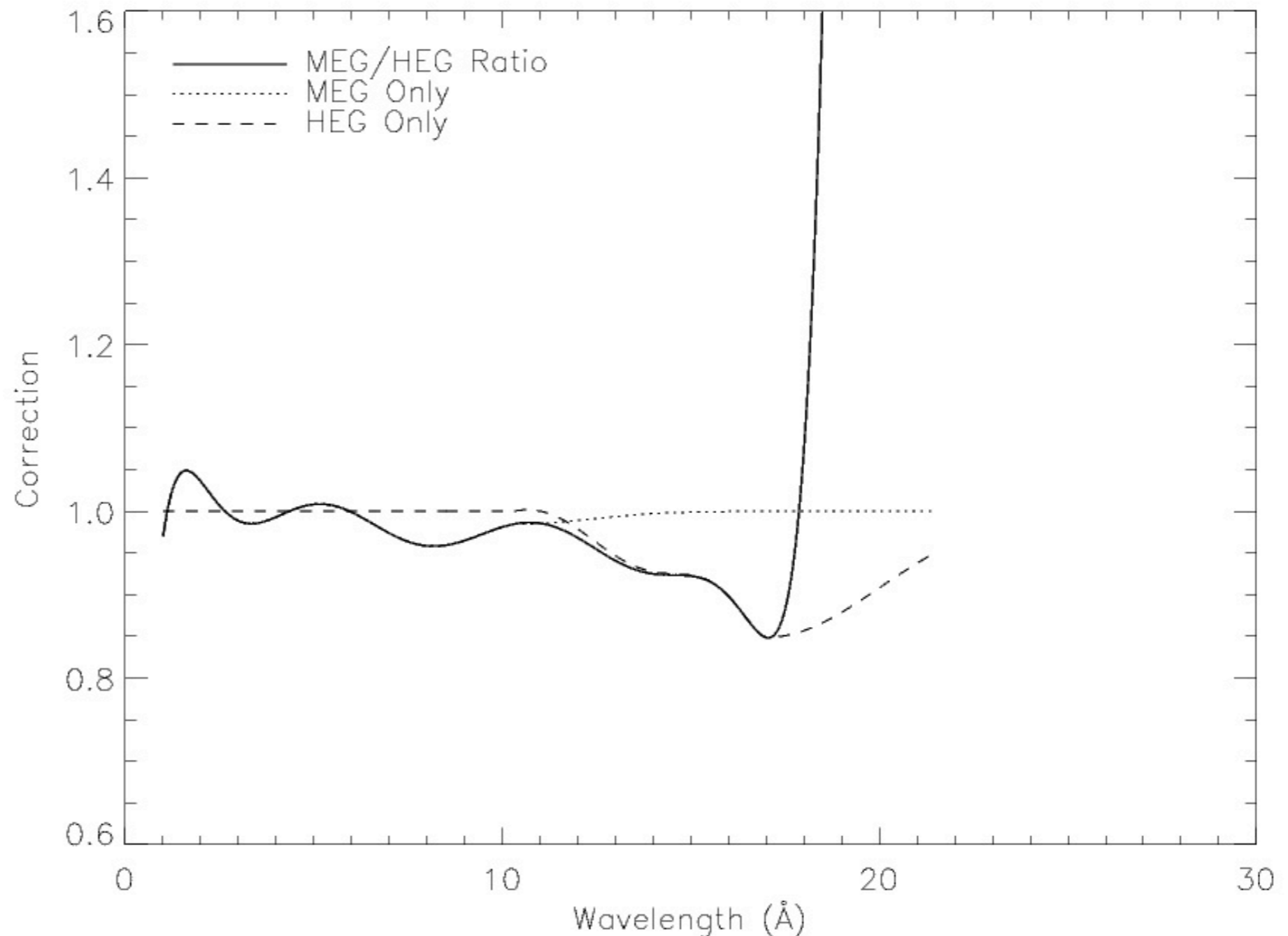
Correcting HETGS Ratio



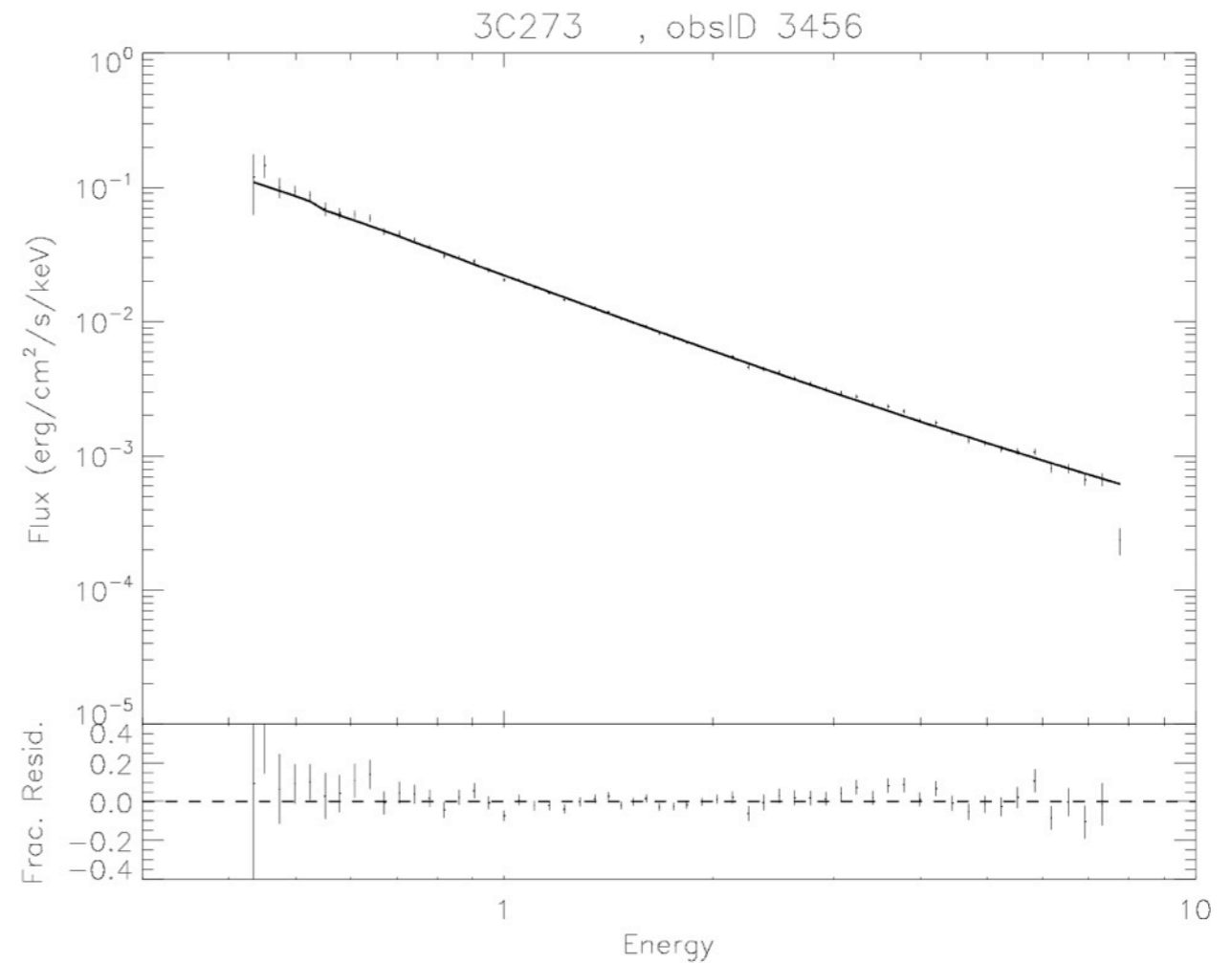
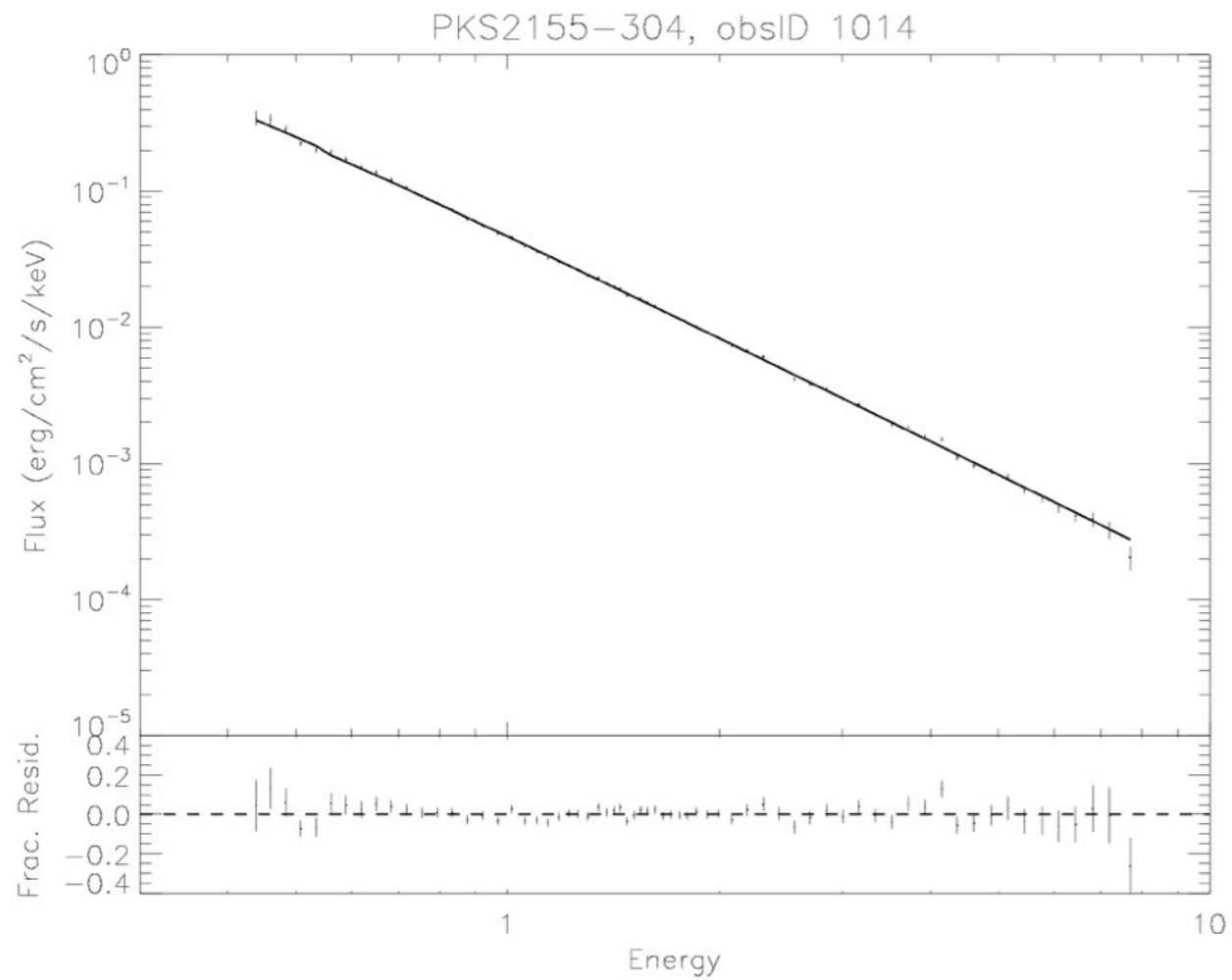
New correction looks good for most data sets

Separating HEG and MEG corrections

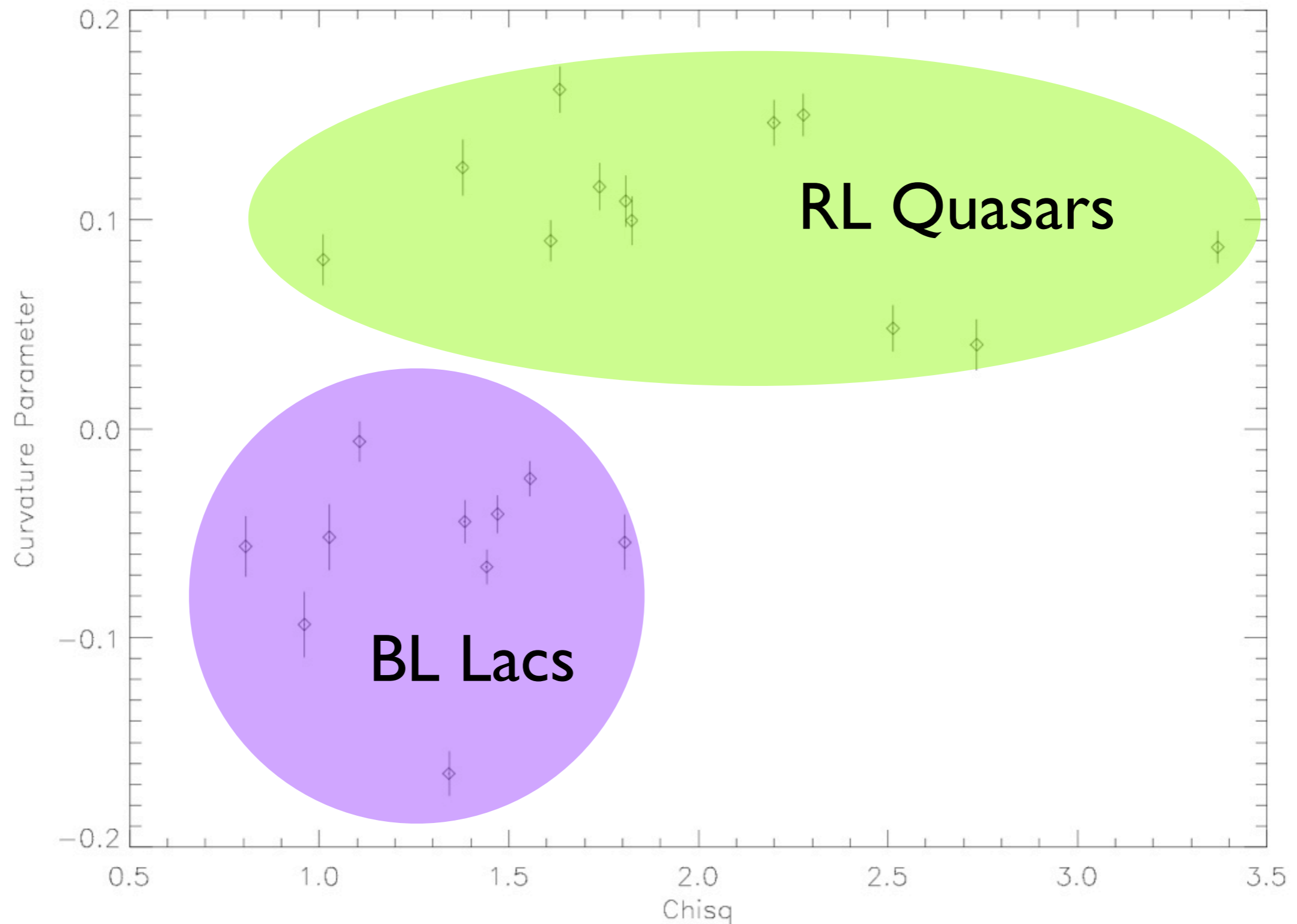
- Use HEG/MEG ratio correction
- Split at 1 keV
- Correct MEG > 1 keV
- HEG gets rest of correction



Applying Corrections

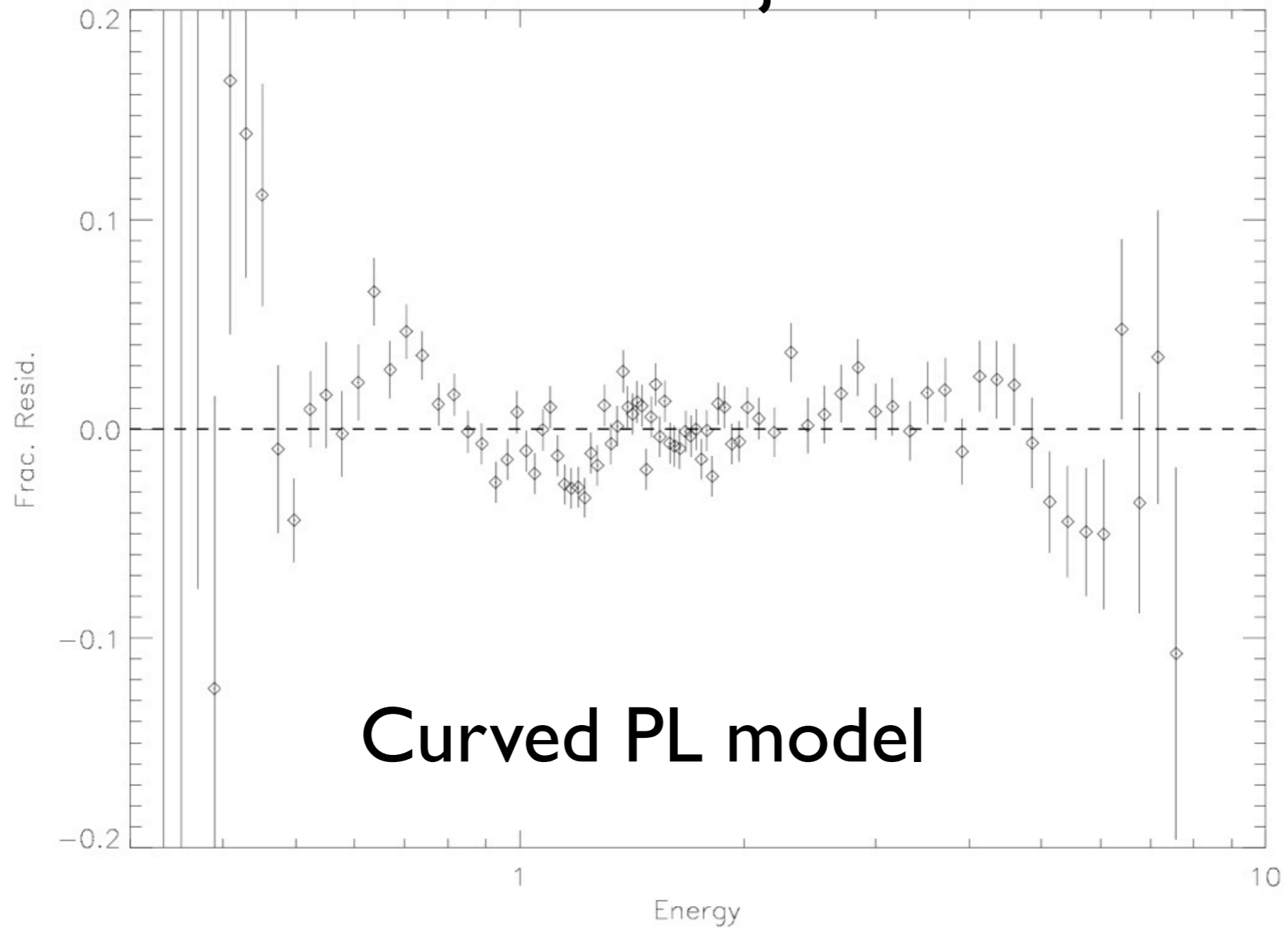


BLLs fit best

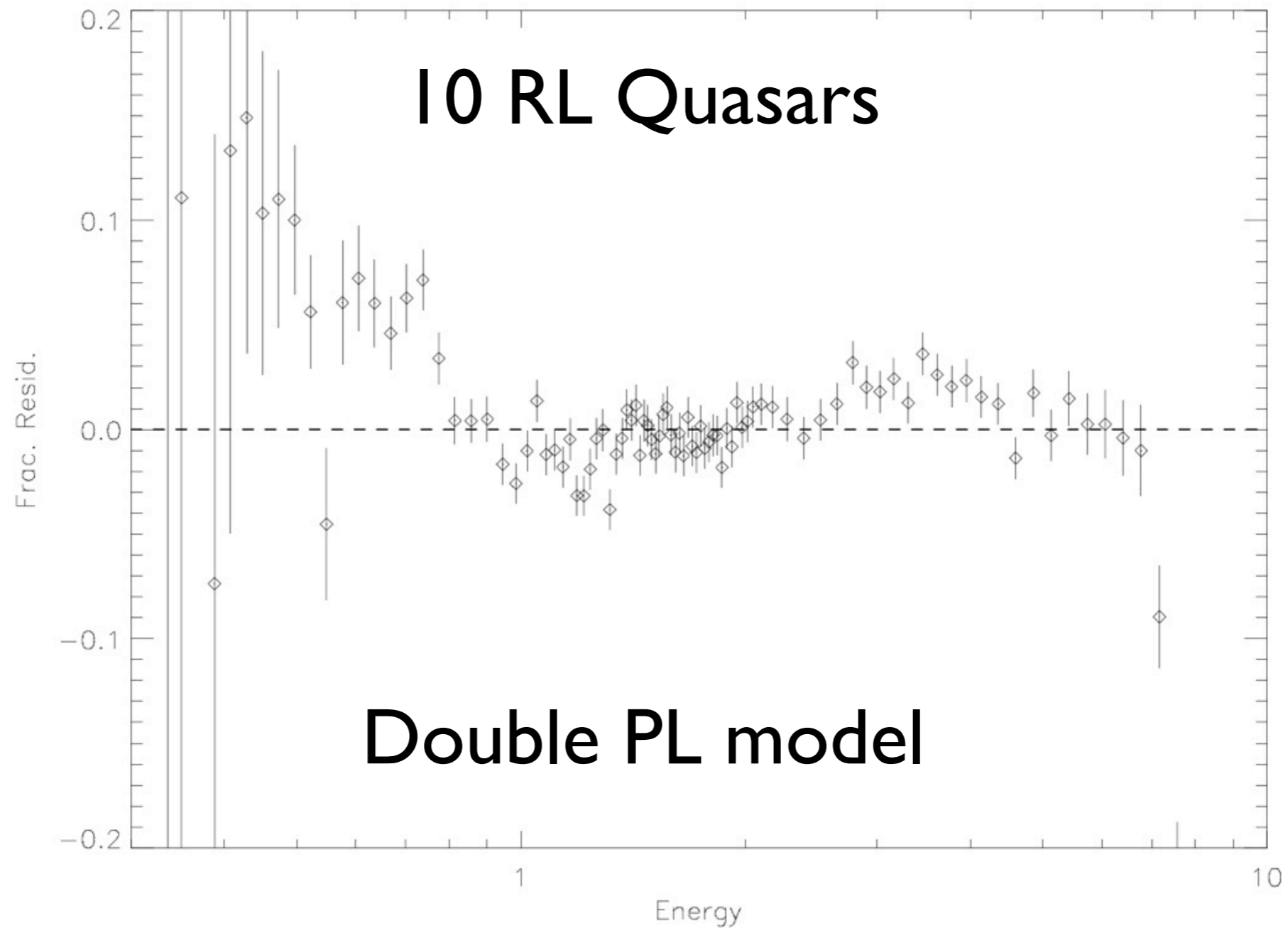


Combining Residuals

8 BL Lac objects



Combining Residuals



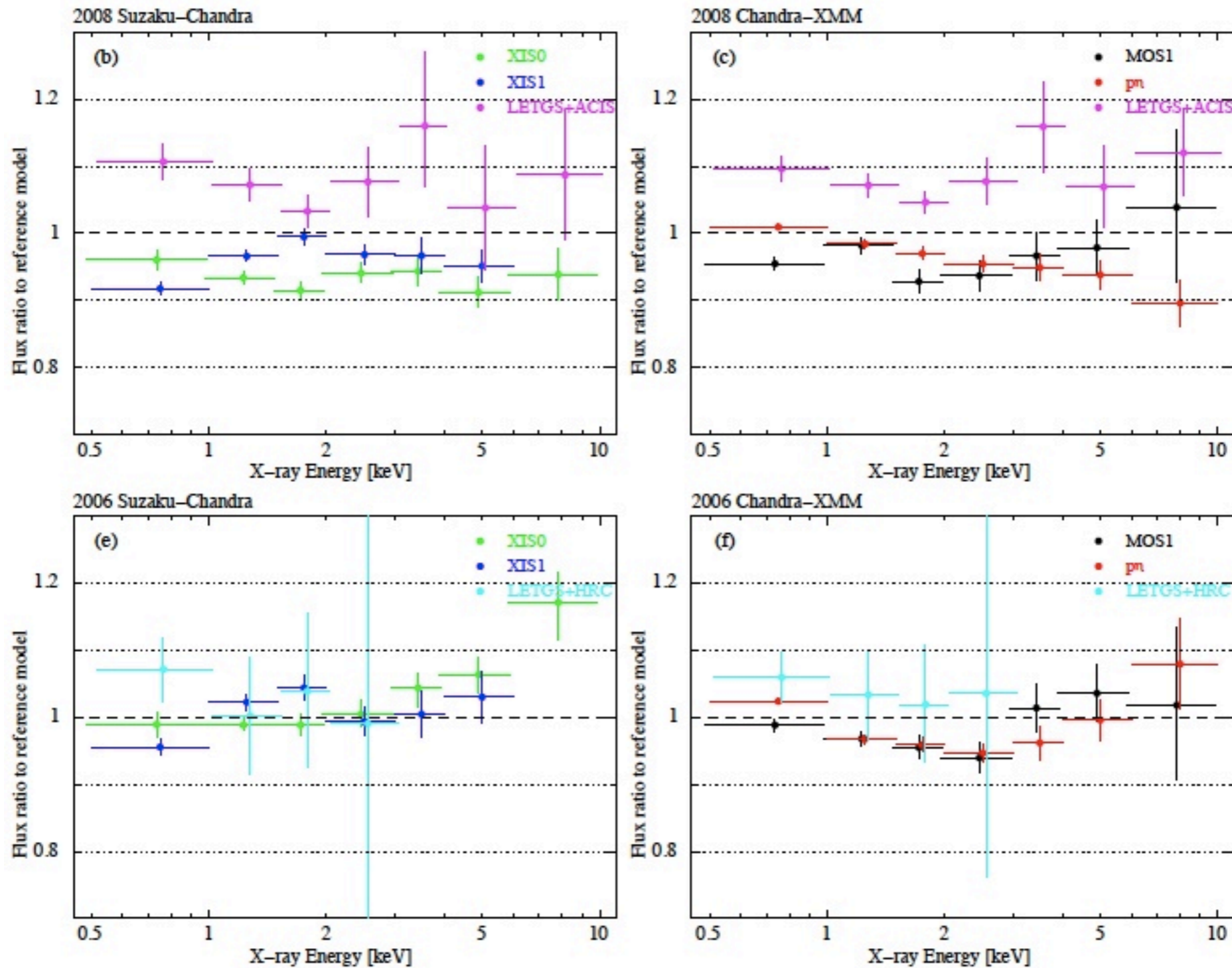
Summary

- Residuals are less than 5% across the entire band with the new correction
- applies to several models of BL Lac objects
- 3C 273 and 3C 382 show larger residuals that are probably real
- χ^2 discriminates apportionment methods
 - Nominal: switchover from fixing HEG to MEG at 1.2 keV
 - $\langle \chi^2 \rangle$ increases if MEG fixed only for $E > 2.3$ keV
 - $\langle \chi^2 \rangle$ increases if only MEG is fixed ($E > 0.8$ keV)

Cross Calibration with XMM-Newton, XTE, Suzaku

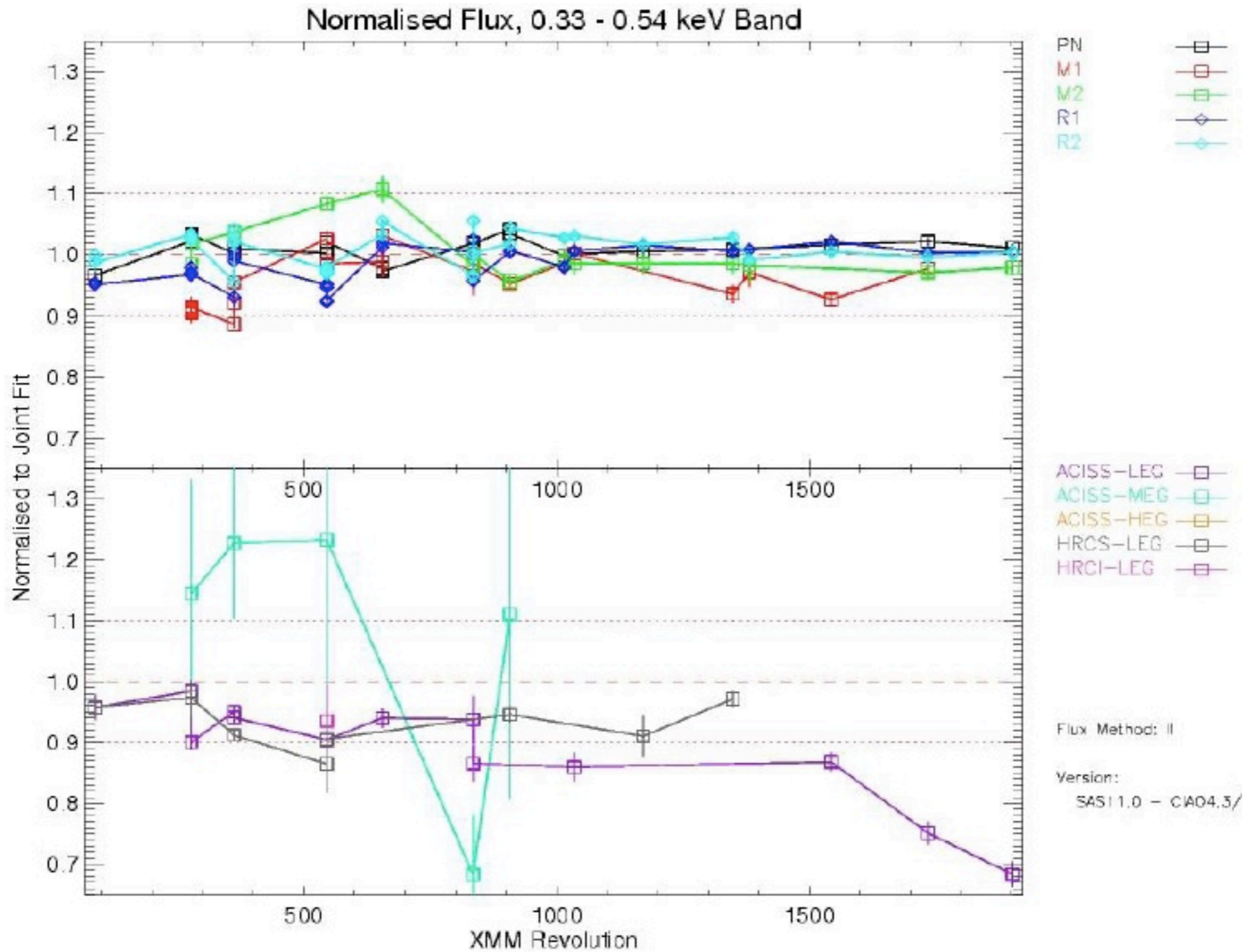
Nov. 22, 2011

PKS 2155 Cross-Cal

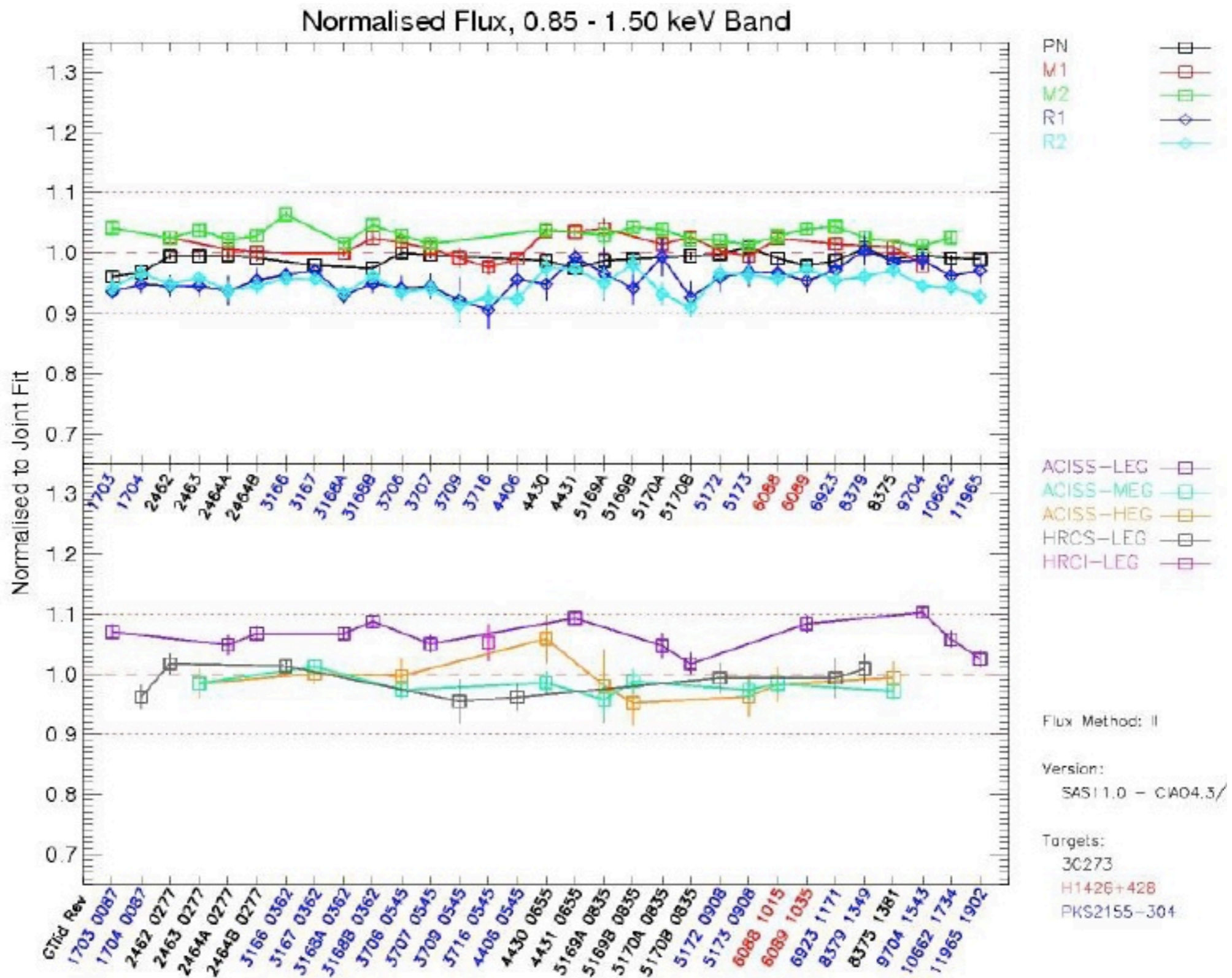


Ishida et al. 2011, PASJ, 63, S657.

XMM/Chandra

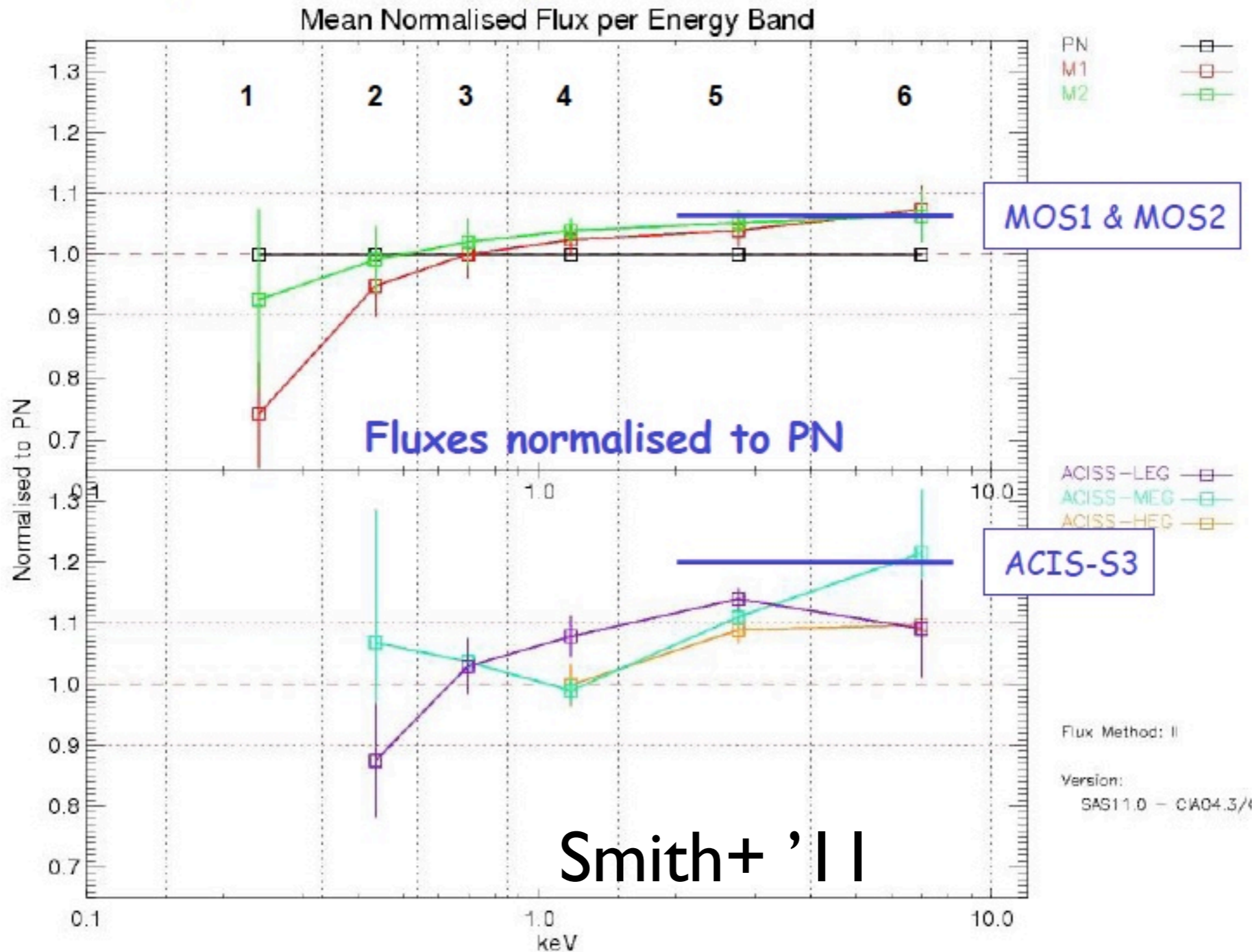


XMM/Chandra

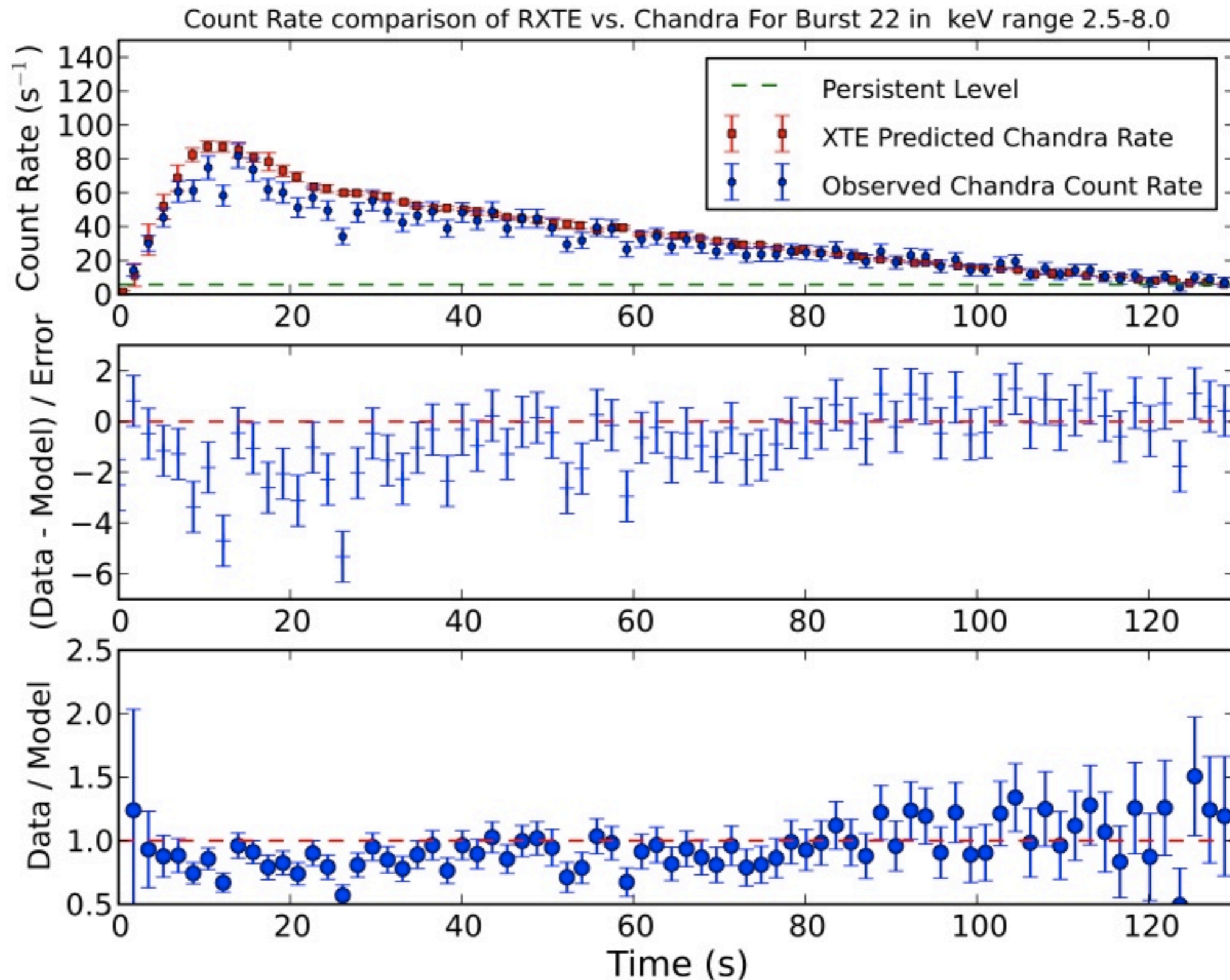


XMM/Chandra

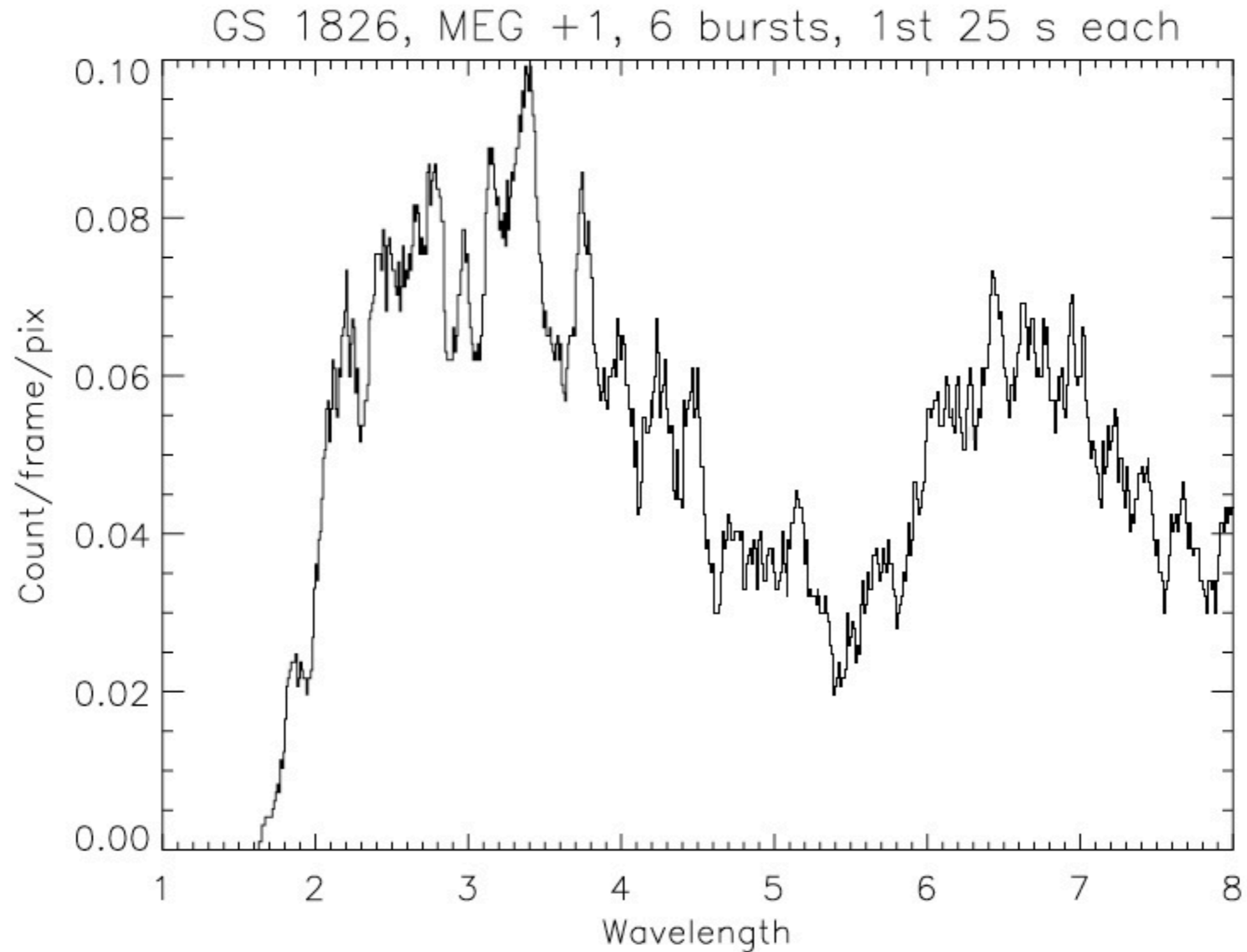
Comparison with Tsujimoto et al. *G21.5-0.9* XCal



Cross-Cal: XTE v. HETGS



Pileup Measurement



Cross-Cal Summary

- PKS 2155-304 with Suzaku, and XMM (Ishida et al. 2011, PASJ, 63, S657)
 - LETG/ACIS is 10-20% high of both Suzaku and XMM
 - LETG/HRC is consistent, perhaps 5-10% high
- Cross-cal with XMM-Newton on Blazars near completion
 - New HETGS efficiency file provided to M. Smith
 - Latest SAS release to be used
 - Expect paper draft by February
- Investigating XTE/HETGS cross-cal issue
 - HETGS is apparently low by ~10%
 - May be result of pileup
 - Checking out other joint XTE/HETGS observations
 - Should help above 4 keV