

Heritage Working Group

11th IACHEC meeting introduction

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5. make sure that all WGs put in their Wiki reduced spectra, responses and analysis procedure for the published IACHEC papers

Journal of
**Astronomical Telescopes,
Instruments, and Systems**

AstronomicalTelescopes.SPIEDigitalLibrary.org

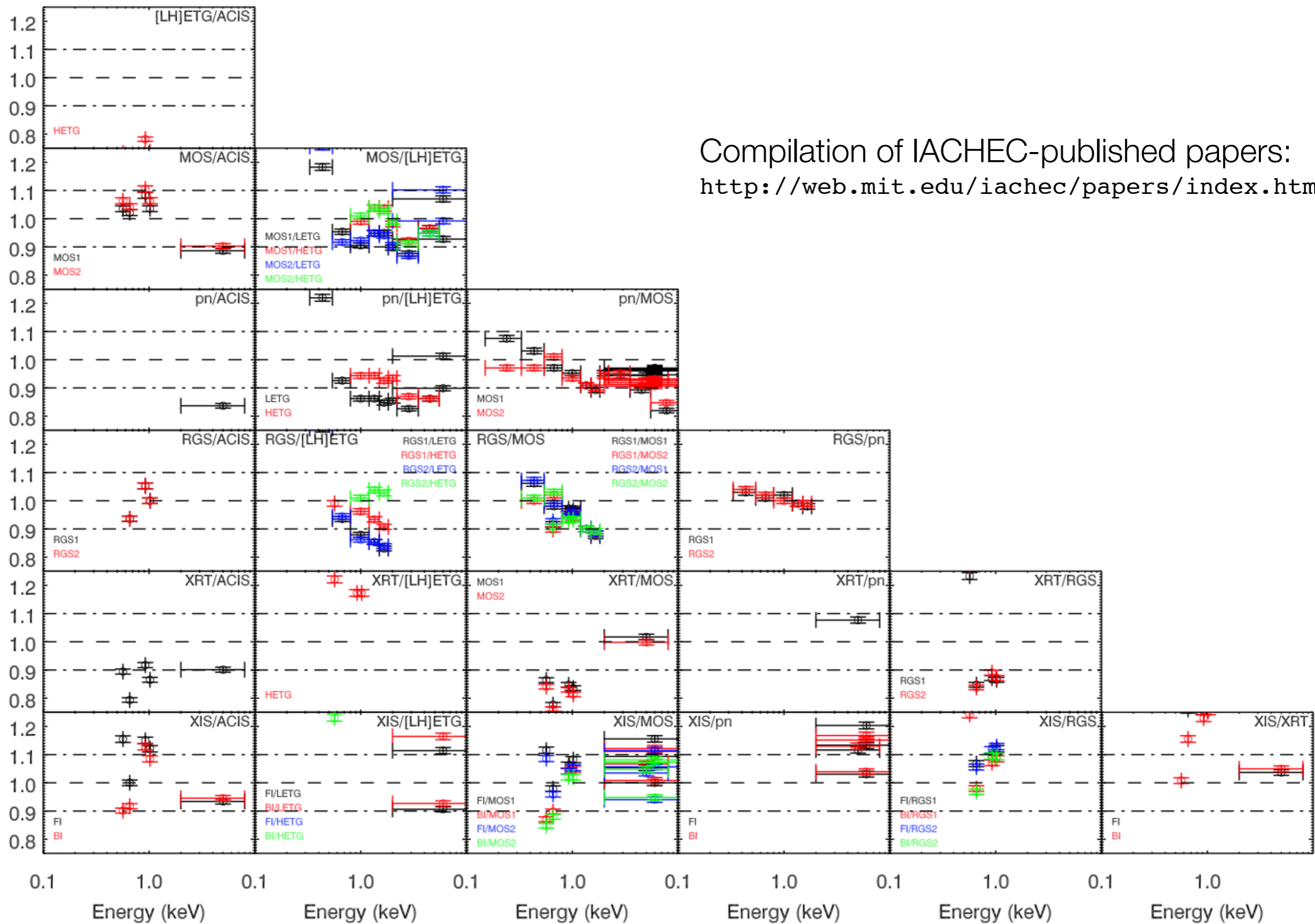
**On the in-flight calibration plans of
modern x-ray observatories**

Matteo Guainazzi
Laurence David
Catherine E. Grant
Eric Miller
Lorenzo Natalucci
Jukka Nevalainen
Robert Petre
Marc Audard

JATIS, 1(4), 047001

JATIS paper final stages

- Submitted in June 2015
- Useful (albeit slightly controversial) referee process
 - more quantitative information on the source properties
 - clarity of figures improved (one useless figure removed)
 - more balanced wording
- Available from the IACHEC web page (no `arXiv` yet)



Compilation of IACHEC-published papers:
<http://web.mit.edu/iachec/papers/index.html>

Database of IACHEC source knowledge and data

Goal: create a single repository of IACHEC sources reduced data, analysis procedure, and scientific knowledge

- Possible thanks to AHEAD-funded resources (~fte for a couple of months)
- Initial requirements defined by Matteo and Lorenzo
- Work can start in a couple of months
- Oriented to be useful, as fancy as the limited resources permit
- Long-term maintenance on the IACHEC WG

multiple choices possible

Search page

Source:
Source type:
Instrument:
Calibration goal:

- 1E0102-72
3C273
Abell1795
Andromeda
...
- Galaxy clusters
X-ray Binaries
AGN
Active stars
...
- ACIS
EPIC-MOS
IBIS
XIS
...
- Energy scale
Redistribution
LSF
Timing
...



Results page

XSPEC model files and plots of multi-instrument campaigns

3C273 PKS2155 Mkn421 Mkn509

```
spectra/acis/3C273_20060915_acis.pi          xcal/fit_3C273_ACISEPICXIS_2002.xcm
spectra/acis/3C273_20060915_acis.rmfi       xcal/3C273_ACISEPICXIS_2002.ps
spectra/acis/3C273_20060915_acis.xcm
spectra/acis/plots/3C273_20060915_acis.ps
spectra/epic/3C273_20010906_pn.pi
...
papers/iachec/Smith_ApJ_802_546.pdf
papers/science/Page_MNRAS_749.34.pdf
...
models/iachec.mdl
models/Page_MNRAS_749_34.mdl
models/3C273_summaryModelTable.txt
```

spectra and responses

link to best-fit plot on individual instrument

link to papers

XSPEC model files

2. Community survey - current status

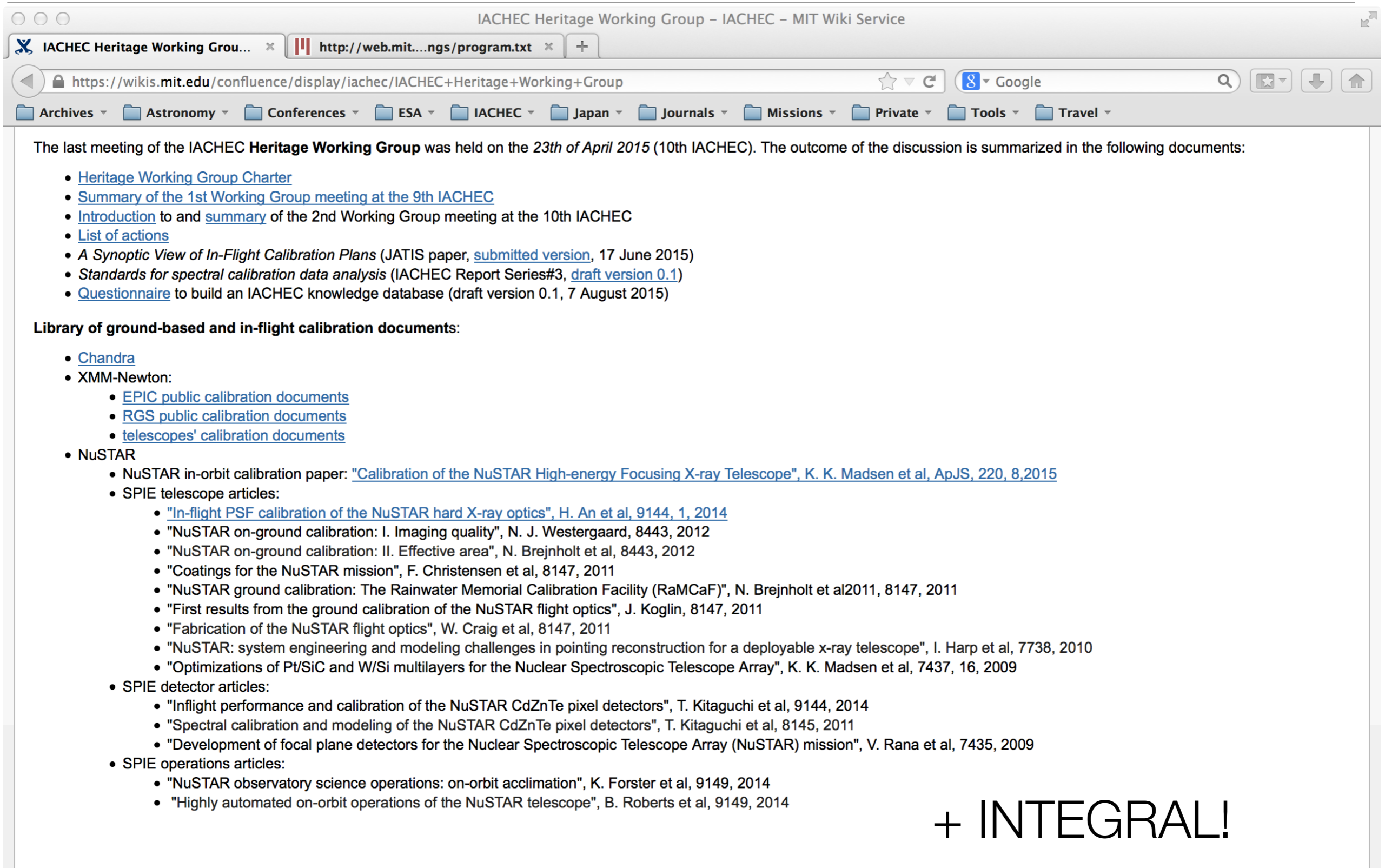
Item	Photoelectric absorption model	Photoelectric absorption cross-sections	Elemental abundances	Optically thin plasma code
	tbnew (XSPEC) hot+ampl (SPEX)	Verner & Yakovlev (1995)	Lodders & Palme (2009)	apec (XSPEC), cie (SPEX)

*this is not lodd in XSPEC!

Survey status

- We extended the survey to ~10 new colleagues: basically no answers!
- Proposal: we include our own assessment of the impact of different prescriptions (e.g., XSPEC default versus recommendation) in an Appendix of a IACHEC paper
- I have proposed this idea to Kristin for the 3C273/ PKS2155-304 paper
- After this, we close this activity

3. Repository of calibration documents



IACHEC Heritage Working Group - IACHEC - MIT Wiki Service

https://wikis.mit.edu/confluence/display/iachec/IACHEC+Heritage+Working+Group

The last meeting of the IACHEC **Heritage Working Group** was held on the *23th of April 2015* (10th IACHEC). The outcome of the discussion is summarized in the following documents:

- [Heritage Working Group Charter](#)
- [Summary of the 1st Working Group meeting at the 9th IACHEC](#)
- [Introduction](#) to and [summary](#) of the 2nd Working Group meeting at the 10th IACHEC
- [List of actions](#)
- *A Synoptic View of In-Flight Calibration Plans* (JATIS paper, [submitted version](#), 17 June 2015)
- *Standards for spectral calibration data analysis* (IACHEC Report Series#3, [draft version 0.1](#))
- [Questionnaire](#) to build an IACHEC knowledge database (draft version 0.1, 7 August 2015)

Library of ground-based and in-flight calibration documents:

- [Chandra](#)
- XMM-Newton:
 - [EPIC public calibration documents](#)
 - [RGS public calibration documents](#)
 - [telescopes' calibration documents](#)
- NuSTAR
 - NuSTAR in-orbit calibration paper: ["Calibration of the NuSTAR High-energy Focusing X-ray Telescope"](#), K. K. Madsen et al, *ApJS*, 220, 8, 2015
 - SPIE telescope articles:
 - ["In-flight PSF calibration of the NuSTAR hard X-ray optics"](#), H. An et al, 9144, 1, 2014
 - "NuSTAR on-ground calibration: I. Imaging quality", N. J. Westergaard, 8443, 2012
 - "NuSTAR on-ground calibration: II. Effective area", N. Brejnholt et al, 8443, 2012
 - "Coatings for the NuSTAR mission", F. Christensen et al, 8147, 2011
 - "NuSTAR ground calibration: The Rainwater Memorial Calibration Facility (RaMCaF)", N. Brejnholt et al 2011, 8147, 2011
 - "First results from the ground calibration of the NuSTAR flight optics", J. Koglin, 8147, 2011
 - "Fabrication of the NuSTAR flight optics", W. Craig et al, 8147, 2011
 - "NuSTAR: system engineering and modeling challenges in pointing reconstruction for a deployable x-ray telescope", I. Harp et al, 7738, 2010
 - "Optimizations of Pt/SiC and W/Si multilayers for the Nuclear Spectroscopic Telescope Array", K. K. Madsen et al, 7437, 16, 2009
 - SPIE detector articles:
 - "Inflight performance and calibration of the NuSTAR CdZnTe pixel detectors", T. Kitaguchi et al, 9144, 2014
 - "Spectral calibration and modeling of the NuSTAR CdZnTe pixel detectors", T. Kitaguchi et al, 8145, 2011
 - "Development of focal plane detectors for the Nuclear Spectroscopic Telescope Array (NuSTAR) mission", V. Rana et al, 7435, 2009
 - SPIE operations articles:
 - "NuSTAR observatory science operations: on-orbit acclimation", K. Forster et al, 9149, 2014
 - "Highly automated on-orbit operations of the NuSTAR telescope", B. Roberts et al, 9149, 2014

+ INTEGRAL!

4. IACHEC knowledge database

- Draft questionnaire sent to the WG members in August 2015
- `https://wikis.mit.edu/confluence/download/attachments/61572873/IACHEC_knowkedgeDB_v0.1.txt?version=1&modificationDate=1438931165000&api=v2`
- No reaction so far
- Shall we go ahead?

5. Data of IACHEC paper on the Wiki

- No IACHEC paper (with data) published since 2013
- A few papers (1E0102-72, 3C273/PKS2155-304, Crab) to be submitted soon
- Make sure that the data are on the Wiki (or on the source database) by the next IACHEC