

十四番目 *IACHEC : 2019 May 23* : 湘南国際村センター

CalStat Working Group

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Calibration Statistics

A forum for the discussion of statistical, methodological, and algorithmic issues that affect the calibration of astronomical instruments, of how calibration data are used in data analysis, and how the analysis results are interpreted.

Themes of 2019

❖ Dealing with atomic data variations

- ❖ Kaastra (thermal line models), Garcia (accreting sources), Smith (plasma models comparisons), Foster (what do you do if you do have atomic data uncertainties), Sawada (comparison of plasma codes), Betancourt-Martinez (Lab Astro for CX)

❖ Modeling corrections to cal products

- ❖ Dennerl (modeling EPC-pn ARF / RMF), Pommranz (CORRAREA), Gaetz (ACIS-I background)

❖ Sweating the mathematical/statistical details

- ❖ Terada (timing calibration), Belanger (periodograms, transients), Kashyap (fluxes from photon event lists), Marshall (Concordance)

2020 Foresight

1. Concordance

2. ARF and RMF uncertainties

3. Atomic emissivity uncertainties

4. Background models

5. The IACHEC Analysis Tips & Tricks Guide

2020: Concordance

- ❖ Include different prior variances τ for a larger data sample
- ❖ Allow cross-talk between different passbands
- ❖ Write an astro-focused paper (Marshall et al. 2020) that includes
 - ❖ more exemplar analyses (like Capella)
 - ❖ assessments of the effects of τ on estimates and error bars

2020: ARFs/RMFs

- ❖ Continued development of EPIC-pn RMF modeling by Konrad
 - ❖ Explore parameter covariances
 - ❖ Explore extensions to ACIS
- ❖ Paper on MCCal (which produces large samples of EAs) in preparation (Drake+2020?)
 - ❖ MCCal for AstroSat

2020: Atomic Data Uncertainties

- ❖ The Lorentz Tests will continue(?)
- ❖ AtomDB (and Chianti) teams are exploring ways to make known uncertainties more accessible to users
- ❖ Application of atomic emissivity uncertainties to Chandra Capella O7+O8+Fe17 data (a la pyBLoCXS)

2020: Background Models

- ❖ Expect to have more models fully specified
 - ❖ ACIS-I FI (TG)
 - ❖ HRC-S dispersed (VLK / BW)
 - ❖ ¿Suzaku (EM)?
 - ❖ etc.

2020: Tips & Tricks

- ❖ A practical guide to statistics and data analysis, containing recommendations, readable descriptions, and illustrative examples
 - ❖ e.g., see Guillaume's talk transcript
- ❖ Intended to be a living document, with frequent updates by multiple authors.
 - ❖ Not a wiki, because maths. A frequently updated pdf that will be accessible from the IACHEC web site.
- ❖ There is a straw man ToC, but really should be driven by FAQs of cal scientists
- ❖ Contact me at vkashyap@cfa.harvard.edu if you want to participate; there is an overleaf document, and I will share the link