

Detectors and Background WG

Where we've been and where we're going

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Detectors and Background WG

- Started as CTI WG in 2010 at IACHEC meeting in Woods Hole, USA
 - Immediately renamed to “CCD Issues” to better reflect members interests
 - Not a typical IACHEC Working Group — presentations and discussion
 - More specialized topics than larger plenary sessions
- Sometimes multiple topics on a requested theme
 - Calibration of timing modes, specifics of CTI correction algorithms, etc.
- Combined with the Background WG in 2014
- Broadened from CCDs to Detectors in 2018

What's worked and what hasn't?

- In person sessions always well attended, many interesting talks and discussions
- Wide representation of missions and instruments; old, new, and future
- Often an opportunity for students or more junior members to present
- Useful for airing out ideas in front of knowledgeable, friendly audience
- Sometimes too many talks, not enough time for discussion – addition of posters to in-person meetings should help
- Not a lot of continuity between meetings

Past future plans

- From the 2019 meeting
 - As existing missions go deeper, and planned missions get more ambitious, understanding and modeling background and detector response only gets more important!
 - For next year, hope to hear about:
 - Empirical background models for use in spectral fitting
 - Many separate Geant4 simulation projects, any specific issues that need discussing?
 - eROSITA!
- Plans for the 2020 in person meeting included a “background workshop” and/or a back-to-basics lesson on best practices for background modeling

Virtual Progress...

- Working group essentially dormant since last in-person meeting, but
 - 2020 Online Symposium included a best-practices for background modeling
 - Eric Miller, “Modeling the background: a case study with Suzaku XIS and N132D”
 - 2021 Plenary session on eROSITA
 - Konrad Dennerl, “eROSITA Calibration and First Results”
 - Gain & CTI calibration (ground and on-orbit), 7 CCDs w/ 384 readout nodes each
 - Particle background at L2 – higher than simulations but less variable than XMM
 - Slides and video recordings are available on iachec.org

Motivation

CXB = cosmic X-ray background; focused
NXB = non-X-ray background; unfocused

- Fit the Fe K spectral region of N132D observed with Suzaku/XIS to extend the IACHEC model.
- Background is challenging:
 - Source, CXB, and NXB are all about the same level at 6 keV
 - No useful local background region due to Suzaku PSF scattering
 - Different ARF and RMF at different locations
 - Background region from offset pointing likely has different NXB characteristics

Simply subtracting background is not ideal, and probably incorrect.

Plans for 2021...

- Continue as usual at September 2021 meeting
 - If in-person, try to allow for remote attendees as much as possible
 - Consider talks you'd like to give on
 - Detector specific performance/calibration issues
 - Background simulating, measurement, modeling
- An incomplete list of topic ideas from me:
 - Continued updates on eROSITA!
 - NICER background modeling tools
 - Background simulation/estimation for future missions
- Would people like additional special sessions over the summer for particularly timely topics?

Hope to see many of you in the fall!

- Think of talks you'd like to give at our next WG meeting
- Email me ideas for topics you'd like to hear more about — cgrant@mit.edu
- Join the `#detectorsbackground` channel in the IACHEC Slack workgroup