

meeting date <i>date de la réunion</i>	15.03.2018	ref./réf.	EPIC TTD 29	page/page	1
meeting place <i>lieu de la réunion</i>	ESAC, Madrid	chairman <i>président</i>	M. Smith		17
minute's date <i>dates de minute</i>	01.04.2017	participants <i>participants</i>	L. Ballo, I. de la Calle, P. Calderon, K. Dennerl, J. Ebrero, M. Freyberg, F. Fürst, F. Haberl, A. Ibarra, P. Kretschmar, M. Kirsch, K. Kuntz, M. Santos-Lleo, P. Maggi, J. Martin, S. Migliari, J.V. Perea, P. Rodriguez, R. Saxton, N. Schartel, M. Smith, M. Stuhlinger, L. Tomas, E. Verdugo		
subject/objet	EPIC Operations Meeting #29	copy/copie	P. Kretschmar, J.R.Muñoz, N.Schartel		

Description/description

1. Review of actions (Michael Smith)

EPIC TTD-027/2 on M. Smith:

Determine which additional HK parameters could be useful to propagate, and what time binning to use.
Determine the mechanism within SAS to do so.

Closed.

(Change into SAS S/W change request.)

EPIC TTD-028/1 on M. Smith:

Include radial profile comparisons in XRT XPSF analysis.

Closed.

2. XMM-Newton status (Jim Martin)

Spacecraft status:

Performance:

- Above 95% limit.
- Some problems with ground station coverage.

meeting date date de la réunion	15.03.2018	ref/réf	EPIC TTD 29	page/page	2 17
---------------------------------------	------------	---------	-------------	-----------	---------

Description/description

Fuel:

- 44.5 kg left, 3.0 kg/year, end of fuel ~2030+ with current consumption.
- Fuel migration: performed in summer 2017.
- Full B-side operations needs to be in place before 2020.
- Replenishment activities will start as of 2020 assuming current consumption.

Solar array power:

- Stable above 1800 W.

4WD side effects:

- Two reaction wheels show non-nominal behaviour since 2008, but with 4WD the situation of the wheel loading relaxed.
- Get wheel 1 to keep below 1000 rpm, tested Sep. 2017, in operation Q3 2018.

MOC system evolution:

- System updates to Linux, ESOC validation April 2018.

Automatisation on ground:

- Eclipse fully automated.
- Future: G/S automation, instrument re-join (good interaction with SOC).

Ground stations

- Yatharagga and Kourou prime stations, Backup: New Norca, VIL2, MSP, Santiago.
- Perigee gap will close ~2021.

SPACON merger

- Decision in 2016 to merge SPACON team of GAIA (1st), XMM-Newton (2nd) and INTEGRAL.
- Overall cost saving, SPACON team reduced from 9 to 6+1.
- Reduction on SPACON workload, knowledge and training.
- Decrease in science performance on XMM-Newton and INTEGRAL accepted.
- Super-alarm tool for safe response.
- De-conflicting tool => shift planning of 1 SPACON for 3 missions.

Questions:

M. Freyberg: How much decrease on science performance has been accepted?
=> 5-10% for XMM, 15% for INTEGRAL.

M. Freyberg: Have values been evaluated afterwards?

meeting date date de la réunion	15.03.2018	ref/réf	EPIC TTD 29	page/page	3 17
---------------------------------------	------------	---------	-------------	-----------	---------

Description/description

=> numbers not have been reached. Additional automation might improve performance in future.

3. EPIC operation status (Pedro Calderon)

Routine operations

- All information on the web.
- OBT updates, last Nov.2017, next Apr.2018.

Eclipses

- Due to orbit evolution lots of eclipses (51) but relative short duration (~45 minutes).
- Due to ground station issues instrument power-off for ~2 hours.
- EPIC-MOS temperature changes by ~50 degree in each eclipse. Pre-cooling of 10 degree before eclipse to reduce maximum temperature during power-off.

Events:

- Almost nothing.
- EPIC-pn switched off by auto command safety 9th June 2018.
- EPIC-MOS “no eclipse” lead to observing at -130°C and with electronic boxes hotter than nominal (4th and 5th September 2018, rev. 2249).
- EPIC-pn quadrant sw crash and auto reboot on 15th January 2018.

Developments:

- SPACON merge with GAIA, trained on platform only, not on instruments.
- In case of instrument issues, put instrument to SAFE and wait for SOC, loss of scientific time accepted.
- Aim: automation, resilience timeline, auto re-join.

Automation:

- Auto safe: in case of HK parameter (voltages, currents, temperatures) out of limit, do not wait for SPACON and power OFF the instrument.
- False alerts due to corrupted values, will improve with more experience.
- Longer reaction time in case of real event.

Automation of radiation protection:

- Auto re-join instead of safe-and-wait.
- EPIC-MOS calclosed in same mode.

meeting date 15.03.2018
date de la réunion

ref/réf EPIC TTD 29

page/page

4

17

Description/description

- EPIC-pn observing go to idle close filter.
- EPIC-pn being configured go to calclosed, same mode.

Automation of timeline resilience

- Problem that SPACONs not operate the instruments.
- If timeline is disabled, no science is performed.
- Solution is not to stop timeline, or re-start it at (almost) any time: in case of stop, we loose current observation, but not the following ones.
- Deactivation (and activation) cover modes now.

Other automations

- EPIC-pn avoid wrong offset table.
- BRAT change from mission planning: introduce BRAT changes into mission planning system avoid manual intervention of the SPACON, but only few predefined BRAT combination offered by the tool.

Questions:

M. Freyberg:

Problem of overwriting of discarded line same than problem of offset tables?

=> yes, similar problem of the ground system due to re-use of file names.

P. Rodriguez:

Reprocessing of ODFs could solve the issue?

=> Data is present in telemetry, if file naming issue is solved, yes.

4. Status of science operations (Maria Santos-Lleo):

News:

- New mission manager: Peter Kretschmar.
- Welcome new scientists: Ivan Valchanov, Eva Verdugo (replacing Antonio Talavera after retirement).
- Reduced dedication to XMM-Newton: Matthias Ehle (ATHENA), Jan-Uwe Ness (INTEGRAL).

Science support:

- AO16 as of 11th Mar 2018, A+B: 85% (left ~2280ks, ~50 obs), C: 31%.
- A017 over-subscription 6.4, papers > 5500.
- Working on SPACON merger: ToO procedure update, mission planning to avoid conflicts.

meeting date 15.03.2018
*date de la
réunion*

ref/réf EPIC TTD 29

page/page

5

17

Description/description

- OTAC support and proposal enhancement (~ done for AO17).
- New multi-year programs (max. 3 years), two proposals accepted: cosmology (survey) & cluster of galaxies.

Mission planning:

- coordination (esp. NuSTAR), ToO, plus “technical“ issues

Working on

- Calibration: RGS versus EPIC-pn, for evaluating possible sensitivity loss.
- Calibration of OM: Jupiter exposure with V-filter by mistake caused elongated depletion patch in OM detector.
- Therefore all pointing in future with EPIC-pn prime, as this boresight is more distant to patch.

Question:

K. Kuntz: Is patch in OM expected to decline?

=> up to now no improvement has been seen.

- SAS: presentation by Richard Saxton.
- Pipeline: presentation by Pedro Rodriguez.
- Archive: on-the-fly analysis, 3XMM (DR7) June 2017, solar system target products in their rest frame.

Next workshop 13-15 June 2018 at ESAC: Time domain astronomy – high energy view.

Question:

K.Kuntz: comment on his difficult proposal: he thanks SOC for the incredible helpful support.

5. SAS status and Development (Richard Saxton):

Novelties in SAS 17:

- GPL licence.
- Python support: build on miniConda 3.
- XMMeXtraction:
 - Python GUI for first stage processing for “nominal” point source observations.
 - First experimental version.
 - RISA: integrated into archive, 570 observation have been extracted using it.
- EPN discarded lines, time average (see MJF talk).

meeting date 15.03.2018
*date de la
réunion*

ref/réf EPIC TTD 29

page/page

6

17

Description/description

- edetect_stack.
- RGS frame jump fixer.
- Multi-pointing mode support.
 - reinstate an old arfgen mode of using the attitude file: arfgen useodatt=yes.
- ESAS updates (presentation K. Kuntz).

Schedule:

- Move into release mode 21st March.
- Validation activities start 26th May.
- Release 7th May, just before Users Group meeting.

XMM upper limit tool:

- includes ROSAT now.

6. Pipeline status and plans (Pedro Rodriguez):

Latest release includes flaring background filtering optimized per source.

Development:

- Merge all EPIC light curves of a single source into single file.
- EPIC light curves per energy band which are used for source detection.
- Bad pixel method for EPIC-MOS: emchain/emproc have third call for task embadpixfind, pipeline missing third call. Question to SSC meeting. In any case will not used before 4XMM catalogue.
- EPIC spectra for piled-up sources.
 - Get exclusion radius using circles centred on the brightest pixel and check count rate of remaining annulus.
 - Accept if count rate decreases below user handbook limits.
- Filter wheel closed as instrumental background:
 - Task evqpd recast nearest FWC data with some oversampling factor.
 - Processed EPIC-pn FF exposures (95 exposures, 74 not dominated by extended emission).
- Time bin for light curves.
- Barycentric correction:
 - Idea: send BC corrected times into archive.
 - EPIC FOV ~ 4.3 sec differential time correction within FOV.
 - Propose skip this correction.

meeting date 15.03.2018
*date de la
réunion*

ref/réf EPIC TTD 29

page/page

7

17

Description/description

Questions:

M.Smith:

For pile-up correction: Why centred on brightest pixel? And not on source centre?
=> because pile-up is a pixel effect.

7. EPIC-pn offset maps in slew observations (Michael Freyberg):

EPIC-pn processing with offset maps (SAS-SCR-7284); slew survey and beyond.

Slew observations do not calculate own offset map, but use offset map of previous exposure.

EPIC-pn offset maps and their use in SAS

- Calculated before the exposure.
- Previously downloaded after the exposure, sometimes even in next revolution.
- Now downloaded before the exposure.
- Imaging mode: use in epreject for removal of MIP effects, removal of optical and X-ray loading.

SAS-SCR-7284:

- Presentation of its text .
- Implementation version 5.16 2015-03-24 and updated version 5.17 2016-06-06.
- Examples of implementation: improvements to low energy images and slew data.
- Discussion:
 - Approach works now for about 3 years for SDFs.
 - SSUM files from mission planning used to obtain proper and timely information about previous science observation for a slew.

Can we do better?

- Public archive of offset maps with time information of the computation time of the offset map.

Questions:

P.Kretschmar: Why there is no keyword or similar connection for the offset maps?
=> setup changed over mission.

N.Schartel: Would it be best to fix this on the ODF level, include the map and HK to generate the maps also for the slew ODFs, that all ODFs have the complete data? Do you have a list for all offset maps and their correlations with the ODFs/SDFs?

meeting date date de la réunion	15.03.2018	ref/réf	EPIC TTD 29	page/page	8 17
---------------------------------------	------------	---------	-------------	-----------	---------

Description/description

=> yes, such a list has been compiled, could send this list to Ramon or Michael Smith.

Action EPIC TTD-029/1 on M. Freyberg:

Provide M. Smith with list of PN offset maps and their respective correlations with ODFs and SDFs.

Action EPIC TTD-029/2 on M. Smith:

Using above list, track that correct offset maps are included in respective ODFs / SDFs.

8. A new ESAS implementation (Kip Kuntz):

Steve Snowden retired, but still is involved in coding, K.Kuntz official contact for ESAS software.

Use FWC data and corner data for background reduction, but bad statistics in FWC, even worse for corner data.

Method: add corner data from multiple observations, but hardness ration show variations. Take into account HR.

MOS:

- Available obsids increased by 5.4X (time by 7x).
- Anomalous state for some CCDs: increased low energy background.
- Reconsider temporal variation of HR.

PN:

- Much less corner data.
- No anomalous states.
- Strong soft response.
- Soft proton flares.
- Out of time problem? Corner data show signature of OOT FOV source emission, e.g. in Pup A data.
- Scattered light: transitions from FOV to corner much steeper for EPIC-MOS and flatter for EPIC-pn. Masks at different distances?
- Soft proton flare cleaning: automate histogram method, can remove all bad data, no flare shape residuals for all filters.
- Pattern selection: $p \leq 4$ selection produces a low energy feature below 1 keV, $P=0$ removes that feature, but reduces count rate by ~20%, $P \leq 4$ are row dependent.
- Flag XMMEA_EP shows low energy features, use $FLAG=0 \mid FLAG=2^{16}$

meeting date 15.03.2018
*date de la
réunion*

ref/réf EPIC TTD 29

page/page

9

17

Description/description

There is a tight correlation between the EPIC-pn corner rate and the EPIC-MOS2 corner rate.

Spectroscopy: IACHEC approach: do not subtract background, but fit it.

Question:

N.Schartel: MOS response cannot model the lines, true for all mission? So resolution is better than we claim?

=> I think yes, the background lines show corresponding residuals with zero line width.

N.Schartel: Should the use of P==0 and no P<=4 for E<2keV a general recommendation?

=> for sources extended over the FOV yes. Create two separate spectra and fit these simultaneous.

9. EPIC-pn closed filter light curves (M.Freyberg):

Pattern distribution:

- Diagonal doubles are automatically split into two singles and go into singles, not to invalid patterns
- Invalid pattern start with triples, no fluorescence line.

Soft proton flares reduced by filter thickness in MOS.

Question:

K.Kuntz: Is there a technical manual on the detailed soft proton interaction dependent on the different filters?

=> Not sure.

EPIC-pn on-board MIP rejection:

- EPIC-pn camera able to reject minimum ionizing particles (MIPs) by selecting on event amplitudes for EFF,FF and LW modes.
- For SW, TI and BU the processor is too slow to finish with rejection analysis.
- If amplitude is above MIP threshold, event is rejected. In case more pixel than a maximum are above threshold, the whole frame is rejected.

EPIC-pn: MIPs versus X-ray background:

- Data selection.
- Selected only FF (973.34 ms) or eFF (199.19 ms) with CLOSED or CALCLOSED filter.
- Restrict to observations where all four Q never enter counting mode.

meeting date 15.03.2018
*date de la
réunion*

ref/réf EPIC TTD 29

page/page

10

17

Description/description

- Correlation 10-12 keV rate vs. Q1 discarded columns (per 20 frames).
- Linear regression for each submode.
- Looking for non-vanishing offset at zero (i.e. in absence of MIPS).
- Result: constant 0.050 ± 0.007 .
- Corresponds to $\sim 25\%$ of “average” value.

Conclusion: there is a constant component in 10-12 keV background that is not related to MIPs and soft protons.

Question:

K.Kuntz: Possibility that ?? can explain the differences we see between spectra of FF and eFF?
 \Rightarrow the OoT fraction is much less ($\sim 3x$) for eFF than for FF.

10. Improving the EPIC-pn RMF and ARF (Konrad Dennerl):

- Update to previous presentations.
- Result from IACHEC initiative on 1E0102-7219: residuals for different observations.
- RMF have ~ 8.5 million elements, each in principle a free parameter. Parameterize RMF.
- ARF 3x2067 elements.
- Compose the RMF of shaping functions SF which are determined by shaping parameters SP.
- Challenge: constraining the correction functions CF: solution to allow appropriate corridors.
- Challenge: stabilising the correction function CF, solution: include CF smoothing.
- Problem of method: depend on knowledge of spectral model of sources.
- Separate RMF and ARF by observing the same non-piled-up constant target with all three filters and fit using the same response all filters simultaneous. Observations executed with 1E0102 and RXJ1856.
- RXJ1856: spectral shape ok, but normalisation 20% different to Chandra LETG.
- Tests indicate that there is an additional O-layer somewhere in the system, excluding the filters, much likely the SiO₂-layer: 3% less efficiency at O-edge.

Future work

- Extend to higher energies.
- Extend to other readout modes.

Questions:

N. Schartel:

At ESTEC, dust was measured on the XMM mirrors, but it was never implemented in the model.

meeting date date de la réunion	15.03.2018	ref/réf	EPIC TTD 29	page/page	11 17
---------------------------------------	------------	---------	-------------	-----------	----------

Description/description

=> Not clear how to handle the absorption of dust with unknown chemical composition.

N. Schartel:

Can we start using this refined low energy RMF model into SAS without waiting for the high energy part?

=> Not recommended. The RMF optimisation is only valid for one mode (SW), one epoch, one detector position, only pattern zero. So far it is not a general result.

11. NRCO-102: Exploring the rejected... (Michael Freyberg):

- NRCO-102: no onboard MIP rejection: OCRs 1467 (2004), 2403+2404 (2018).
- FF closed rev.790: pattern distribution in case of MIP rejection is switched off.
- Only 5 CCDs were active: 4,5,6,9,10. Still continuously running into counting mode.
- Short LW closed rev.3334: all 12 CCDs selected, pattern distribution in case of MIP rejection is switched off. Continuously running into counting mode, but not as often as expected.
- Long LW closed in rev.3338 with same configuration, all 12 CCDs.
- NRCO-102 successfully performed, better than expected.
- FF and LW mode data now analysed in parallel to determine mode dependent differences.
- SW, TI and BU mode data do not have onboard MIP rejection, no NRCO required.
- eFF mode data without onboard MIP rejection are missing yet. Expect non-linearity in periods of flares and significant counting mode.

12. Time resolved implementation of PN background gain correction (Michael Freyberg):

Parameter backgroundgain: gain depend on background rate.

Currently exposure-averaged HK values are used for CAL corrections: NDISCLIN along with mode dependent conversion factor.

Issue: high background.

Questions:

- What HK parameter are relevant.
- What time bin size for FITS HK file.
- What time bin size for CAL.
- How should time bins be aligned with other times or intervals.
- How should we deal with data gaps, outlier, wrong values.

meeting date 15.03.2018
*date de la
réunion*

ref/réf EPIC TTD 29

page/page

12

17

Description/description

Time scale driver: CAL

Need sufficient accuracy for HK parameters used for corrections otherwise outliers cause more harm.

Gap handling:

- Telemetry gaps of several minutes.
- Counting mode gaps of several tens of seconds.
- Outliers and wrong data: filtering?
- Use 90% percentile?

Implementation:

- Inside epframes, epevents, epchain.
- Parameter switch to use average or time-resolved values.
- Extension HKAUX with TIME and DSLIN values with highest resolution.
- Extension is read and DSLIN value determined according to chosen time bin size.
- This is then propagated to CAL (like before).
- Time binning currently under development/testing.

13. EPIC fluorescence lines and proton vignetting (Pierre Maggi):

Background subtraction for faint extended sources is not a good idea, better simultaneous fitting of background and source spectra.

How to constrain the strength? Is it ok to leave the line/continuum ratio free? Can we constrain the line/continuum ratio a priori?

Dataset to extract instrumental spectra only: filter wheel closed.

Tight linear correlation between line (MOS Al/ pn Al+Cu) and continuum, with outliers. Origin of outliers?

Radiation monitor: two detectors, low and high energy, both Si-diodes.

Outliers correlate with highest radiation monitor count rates.

Does including solar-flare closed filter observations affect FWC dataset spectrum?

- Higher continuum.
- Spectral shape relatively unchanged by flares.

meeting date 15.03.2018
*date de la
réunion*

ref/réf EPIC TTD 29

page/page

13

17

Description/description

Open questions:

- Time lag of fluorescence lines?
- Spatial variations? Map of line/continuum rations?
- Shall solar flare closed data be included into the FWC data set?

Proton vignetting:

LMC data set: large number of exposures (>300 per detector), span range of flare level.

Measure surface brightness at high energy.

Measure the vignetting profile for protons: vignetting factor vs. radius (arcmin).

Comments:

K.Kuntz: we did not see any dependence of the proton vignetting and solar flare strength.

Question:

M.Smith: should strong flare observations be excluded from background maps?

=> yes.

Comment by I. de la Calle: these are already excluded.

14. Monitoring of the EPIC-pn timing (Jacobo Ebrero):

Definitions:

- Absolute timing: time with reference to standard time defined by atomic clocks or other satellites.
- Relative timing: capacity to measure time intervals and periodicities reliable.
- Use Crab pulsar.

Relative deviation of periods $<3 \times 10^{-8}$ s compared to radio data.

Absolute timing about -300 μ s to radio, compared to RXTE, Chandra and INTEGRAL the absolute timing accuracy is <80 μ s (90 μ s TI, 70 μ s BU).

TI and BU discrepancy:

- Seasonal pulse profile distortion in TI (not BU), caused by loss of counts due to FIFO overflows at different phases of the Crab pulses.
- Delay with respect to the radio pulse is systematically different: TI: -303+/-17 μ s, BU: -374+/-11 μ s.

meeting date 15.03.2018
date de la réunion

ref/réf EPIC TTD 29

page/page

14

17

Description/description

- Only seen in absolute timing analysis, not in relative.
- More FIFO overflows in TI.

Timing modes mostly scheduled in the middle of the revolution, and burst modes at beginning and end.
 Are there systematics due to the ground stations used?

Action EPIC TTD-029/3 on J. Ebrero:

Ensure orbital phase of BU and TI mode observations of the upcoming Crab pulsar observation is switched with respect to the past observations.

Question:

M.Santos-Lleo: Which one is more consistent to other missions?

=> BU more consistent with RXTE, TI with Chandra and INTEGRAL.

M.Freyberg:

Does the absolute time difference vary between spring and autumn?

=> good questions, I don't think so, but needs to be evaluated.

15. EPIC-MOS monitoring (Martin Stuhlinger):

CTI:

- New CTI+ADUConv CCFs uploaded.
- First 12 epochs (revs.<1074) identical.
- New epochs defined, triggered mainly by trap offset changes.
- Epoch conformity between MOS1 and MOS2 broken for new defined epochs.
- Traps can show all kind of behaviour, increasing, decreasing, appearing and disappearing.

Line monitoring:

Al and Mn calibration lines within expected range over the whole mission, soft trends of under-correction with time in MOS2 CCD4+5.

Low energy noise plateaus (MOS2CCD5 effect) still frequently present, mainly in MOS2 CCD5 and MOS1 CCD4.

MOS1 meteorite column calmed down, even disappeared since about 70 revolutions. Got active again within current eclipse season.

Telemetry monitoring indicates increased MOS1 count rates due to hot column in CCD2. Two

meeting date date de la réunion	15.03.2018	ref/réf	EPIC TTD 29	page/page	15
					17

Description/description

observation with unusual focal to periphery count rates traced back to bright sources in FF modes (intended).

MOS2 instrument anomaly on 03.09.2018 with sudden RAWX shift by 256 columns in focal CCD1 after ~6 ks.

Flash frame (with following counting mode) of single events in MOS2 on 25.06.2017 (ObsID 3213_0800960401_S002). Unlikely a signature of an micrometeorite impact. No damages detected. Origin unclear as FOV imprint present, nothing in MOS1.

Obs. 3249_0802080501:

- Operational error during first eclipse caused EPIC-MOS to observe with focal plane temperature 10 degrees lower than nominal and EPIC-pn with increased quadrant box temperatures.
- EPIC-pn quadrant box temperature calibration corrects possible gain shifts at upper border of calibration range.
- MOS2 exposure at -130°C shows significant change in energy scale. Same result expected for MOS1, not analysed due to source with extended emission over FOV and 2 missing CCDs.

16. EPIC-pn monitoring (Michael Smith):

MOS bad pixels: increase of bad pixels in MOS1 CCD2 RAWX=431, to be blanked with the update of the onboard bad pixel table.

MOS background maps: most CCDs are around zero, MOS1 CCD7 FF needs a update, also MOS1 CCD1 SW mode.

Pn noisy pixels: no update required.

Pn offset maps: everything as expected, stable situation.

Pn CTI: CTI steadily increasing, Q4 illumination by calibration source not sufficient any more for CTI measurements.

Pn energy reconstruction:

- FF at Al stable for all CCDs, with the small offset at the first revolutions of the mission.
- FF at Mn the situation for the complete CCD4 looks not optimal, but calibration optimised for boresight position (20 rows). Looking into boresight position only, situation is fine and stable.
- CCD4: SW stable at Al, but trend for undercorrection at Mn. Only few SW calclosed exposures

meeting date 15.03.2018
*date de la
réunion*

ref/réf EPIC TTD 29

page/page

16

17

Description/description

trend is made by just 3 exposures. Can we trust these data points?

Pn energy resolution for FF:

Steady increase of order 0.05 ADU/year at Al and 0.15 ADU/year for Mn. Taken into account in the time dependent response matrix.

17. CORRAREA calibration status (Michael Smith):

CORRAREA is empirical correction of the EPIC on-axis effective area by an E-dependent multiplicative factor. Implemented as non-default since SASv14.

Data basis was sample of 46 sources. Aim to recalibrate with larger sample and automate the process for future updates.

Increase sample using 3XMM-DR-7:

- Point like sources.
- All modes (previously only FF).
- All filters (previously only thin/medium).
- Minimum count limit, for sufficient statistics.
- Maximum count limit, to avoid pile-up.
- Not in crowded field, avoid PSF superposition.

New sample now ~350 sources (= observations): screening required.

Automated steps:

- Mainly done via bash, python and IDL.
- Data processing.
- Common GTI filtering.
- Image creation for visual screening and background region selection.
- Spectral products and responses.

Screening:

- Crowded field.
- Target appears extended or within extended emission.
- Anomalies e.g. loss of quadrant.
- Background selections.
- Pile-up: source count rate, pattern distribution, diagonals (MOS).

meeting date 15.03.2018
date de la
réunion

ref/réf EPIC TTD 29

page/page

17

17

Description/description

Summary and outlook:

- Automation done to a large degree.
- Source selection criteria expanded.
- 301 possible new targets.

Comment:

R.Saxton: Every time something is changed, e.g. PSF, the calibration must be done again.
=> Correct. Screening required once, scripts are available to facilitate recalibration.

20. Summary of new actions (Michael Smith):

EPIC TTD-029/1 on M. Freyberg:

Provide M. Smith with list of PN offset maps and their respective correlations with ODFs and SDFs.

EPIC TTD-029/2 on M. Smith:

Using above list, track that correct offset maps are included in respective ODFs / SDFs.

EPIC TTD-029/3 on J. Ebrero:

Ensure orbital phase of BU and TI mode observations of the upcoming Crab pulsar observation is switched with respect to the past observations.