

# OM Status

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XMM User Group meeting  
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# OM Status

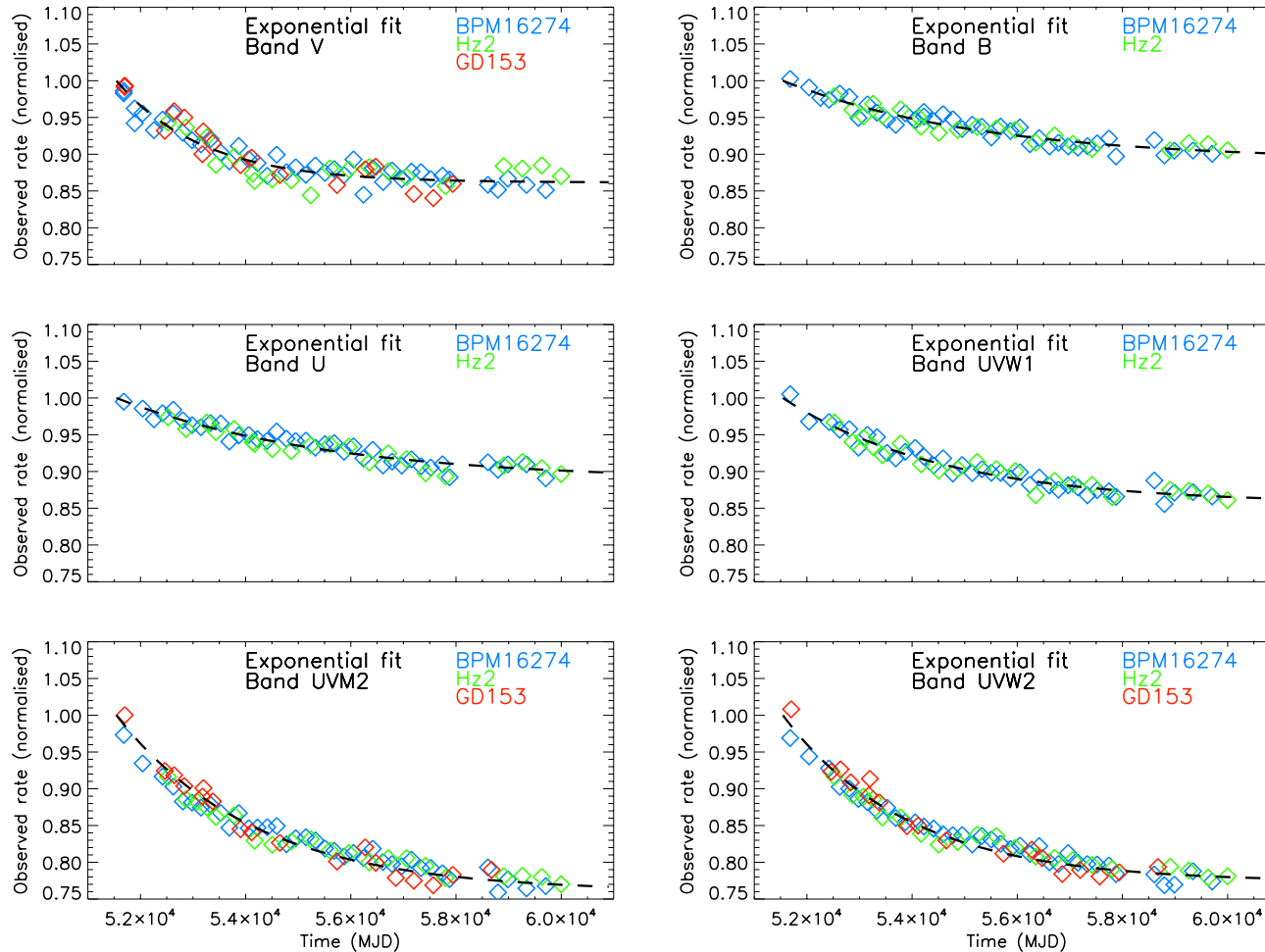
- OM continues to operate as 'normal'.
  - SpaconS covering 3 missions so continuing to improve automated recovery procedures to
    - reduce manual interventions and human errors
    - speed up recovery → fewer lost exposures

R. Perez Martinez

# Time-dependent sensitivity degradation



Simultaneous exponential fit to suitable data from all 3 standards up to rev 4250



## OM throughput at 2030

Filter	Throughput (2030)
V	0.86
B	0.90
U	0.89
UVW1	0.86
UVM2	0.76
UVW2	0.78

Minor modifications to SAS CAL tasks to apply corrections.

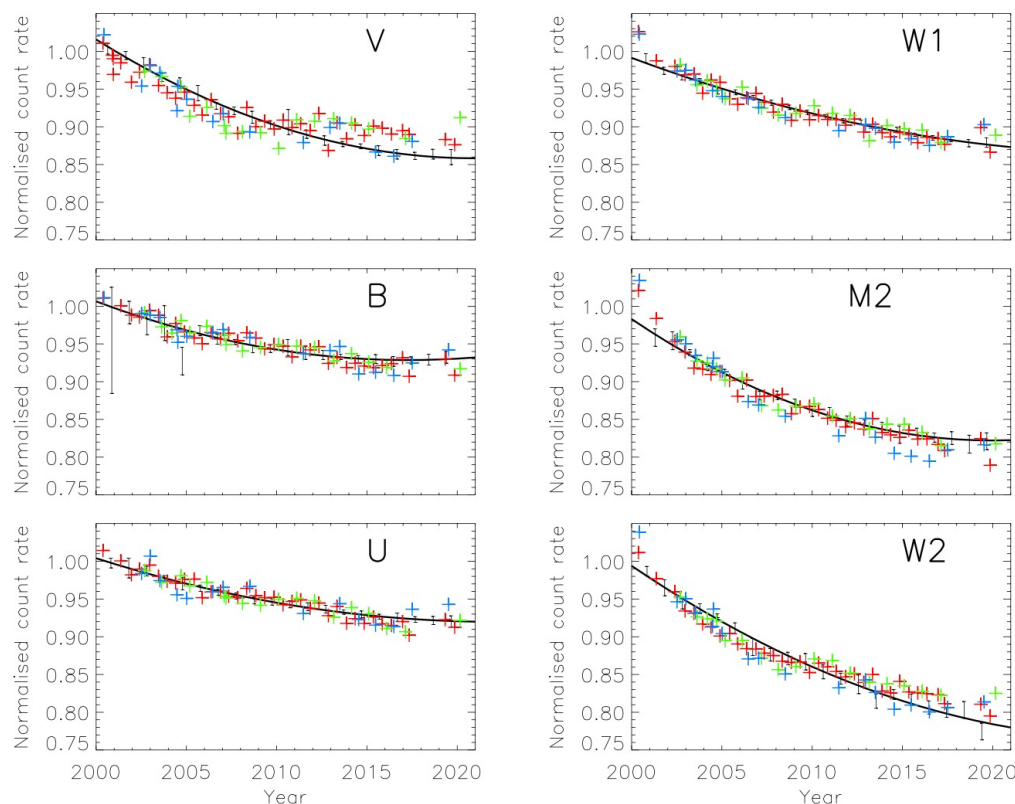
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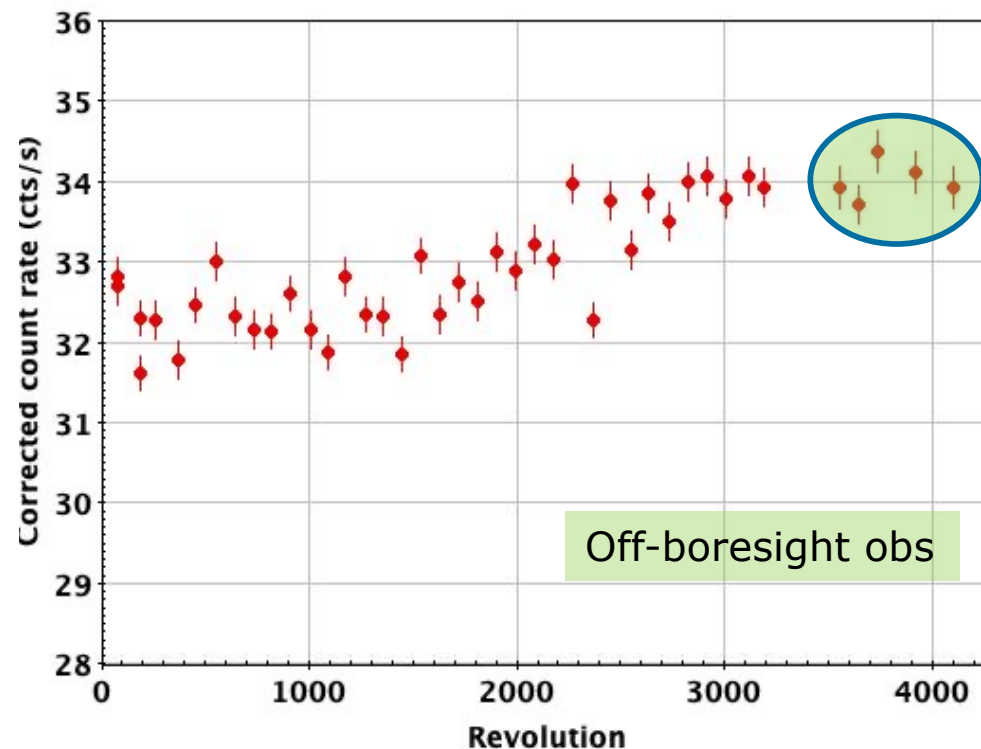
# Time-dependent sensitivity degradation – standards v catalogue sources

- Known difference of up to  $\sim 4\%$  in degradation determined from standard stars and from 'constant' catalogue sources, mainly in V and W2?

Standard star – rate declines  
Catalogue TDSD overlays (black)

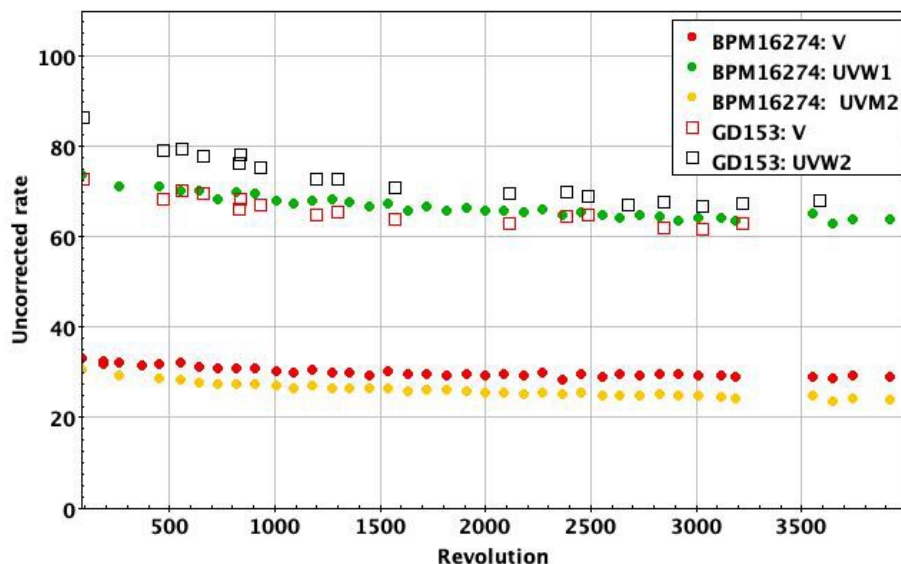


BPM16274 (V) – corrected for current TDSD

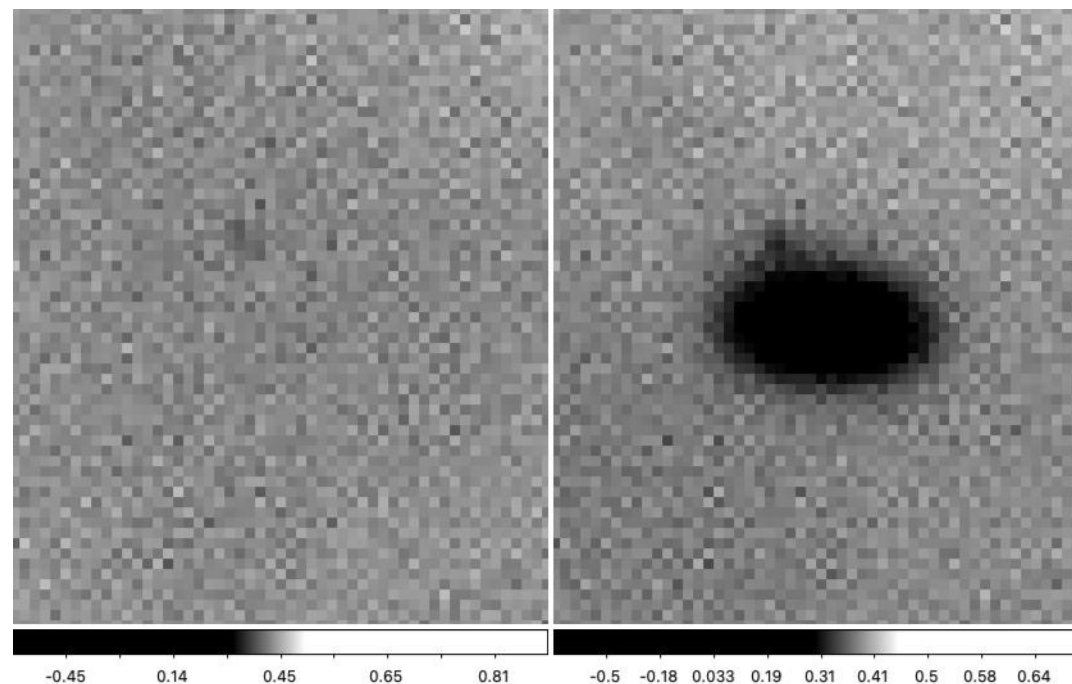




# Time-dependent sensitivity degradation – standards v catalogue sources



Rate effect? – similar rates in filters with/without deviations. Not rate effect

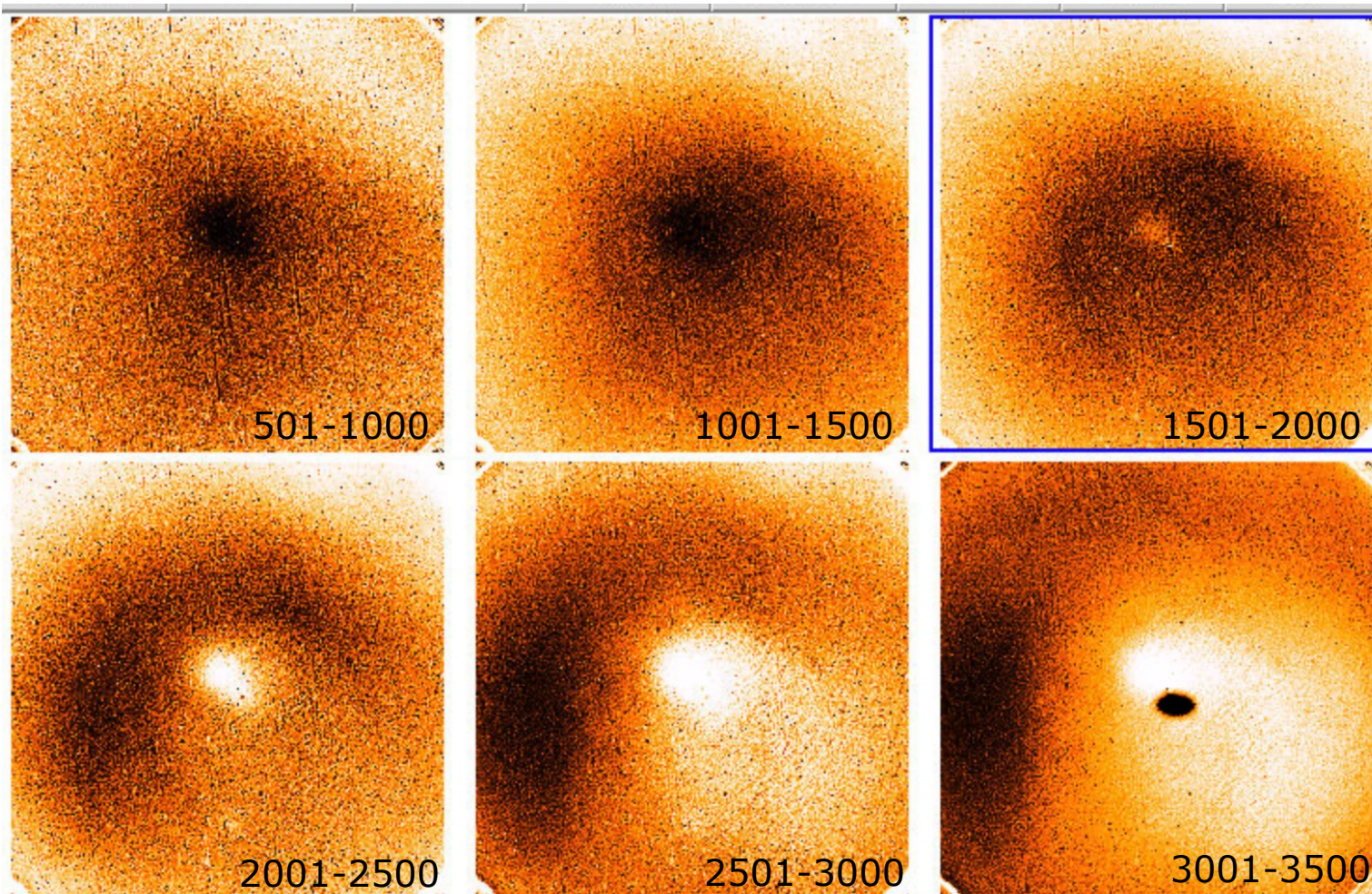


Localised boresight degradation – goes the wrong way at later epochs. Also, observations of standards off-boresight show similar behaviour.

Biases from the methodology? Possibly.

*But.....*

- Spatial time-dependent degradation of the detector pulling some of the field star rates down?



Ratios relative to image from revs 1-500

Calibration  
'white' light flats

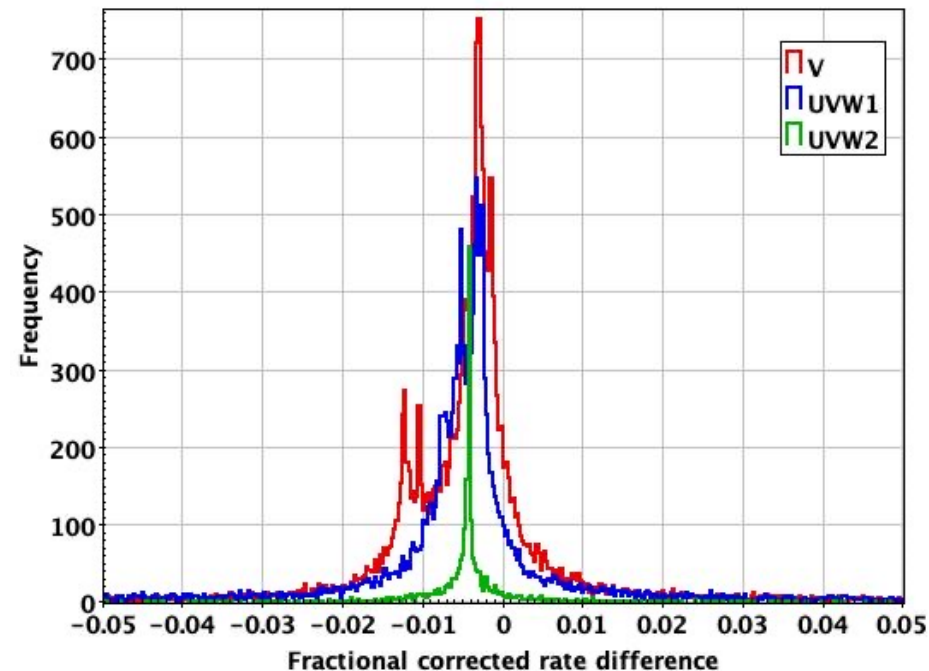
Need per-filter sky flats to verify. If confirmed, characterise filter and time dependencies.



- **Endorsement 2022-05-17/09:** *The UG strongly appreciate the efforts of the SOC OM calibration and MSSSL teams to prepare the XMM-OM SUSS6 catalogue and is looking forward to its release in late 2022 or early 2023.*
- **Recommendation 2022-05-17/10:** The UG recommends that the determined update for the OM time- dependent sensitivity degradation (for the filters) is applied prior to the SUSS6 catalogue generation and release.
- Next version, SUSS6, previously aiming for Dec 2022.
- Now aiming for Autumn 2023
  - Following UG recommendation, and comparative analysis of XMM production pipeline and bespoke pipeline products, process is making use of production pipeline products

Comparisons of subsets of same observations in SUSS5 and from standard pipeline

- On average, SUSS5 contains 94% of pipeline detections
- SUSS5 contains, 1-15% more for cases where pipeline does not mosaic certain modes
- Matching rates (1'') average 88%
- Matched sources generally show good astrometric ( $< 0.2''$ ) and photometric ( $< 1\%$ ) agreement.





- Catalogue will comprise ~12050 observations (likely ~ 10 million detections).
- Main loss is a number of detections from mosaic (stacked) images of a few hundred fields where modes are combined by the bespoke pipeline but not by the production pipeline (total numbers are small)
- Implementation of an updated time-dependent degradation correction would require a Bulk Reprocessing - envisaged for 2024, i.e beyond timeframe of OM catalogue production
  - Flat-field analyses indicates need to understand/clarify validity/application of TDS based on standards
  - Catalogue photometry could be corrected post-production, in principle but then not consistent with archive
- Better to postpone application of new TDS approach
- *Catalogue generation is underway*

# Forward look and other issues

- Production of SUSS6 with current calibration
- Update TDS characterization based on standard stars
- Complete evaluation of spatial sensitivity variations and, if appropriate, generate time-resolved flat-field maps per filter
- Update of the OM Calibration Status document

