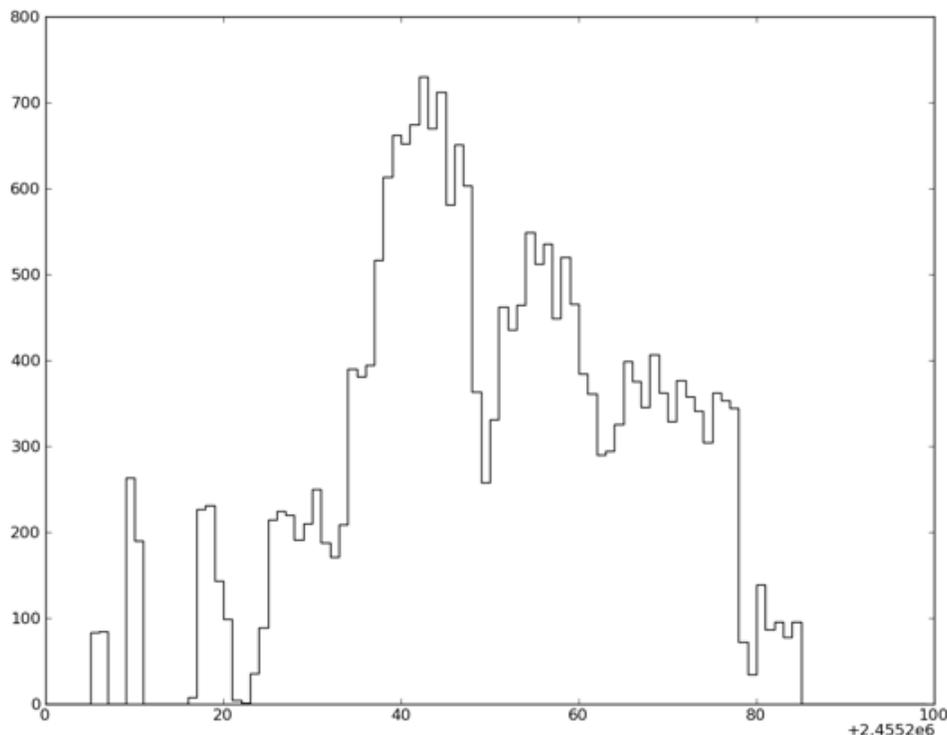


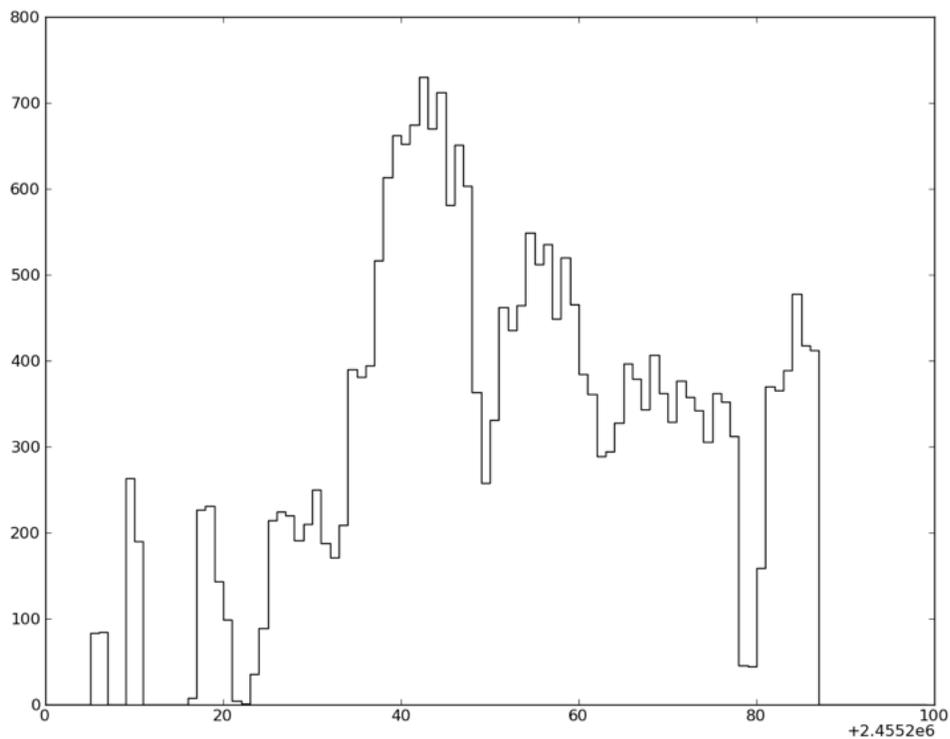
## MEMO REGARDING WMOPS V3.5 EFFECTS AND ADJUSTMENTS

The run 10087a marked the start of V3.5 processing for WMOPS. For that run, it was noted that the detection statistics dropped off by a fact of approximately 4 with the implementation of the WSDS v3.5. The WMOPS team identified the problem as the following: WMOPS does its detection filtering for latents and diffraction spikes *prior* to tracklet generation. WMOPS has been flagging on all categories of latent flagging, both merely "contaminated" and "definite" artifacts, including bands that are not used by WMOPS, but were relatively inactive (with respect to ARTID flagging) prior to pipeline V3.5 release. Version 3.5 had two major changes: bands 1 and 2 latents were being flagged regularly, and frames in the Galactic Plane that were previously dropped during the processing were now being processed, allowing ARTID to identify a much larger number of ARTID latents.

These latents were appropriately flagged in V3.5 for the purposes of maintaining photometric purity in the co-add reductions and products, but were now over-zealous for the purposes of WMOPS ARTID filtering. Add to this the fact that another sub-process, Dynacal (implemented after the IOC), significantly mitigates the effects of latents on our images, we can actually now use a large fractions of the detections that fall on latent areas.



To mitigate the over-rigorous ARTID filtering on the next run (10089a) and to test the hypothesis that the drop in the detection rate of objects was related to the above phenomenon, we turned off the "contaminated" detection filtering, and re-ingested the post V3.5 data. This resulted in only modified tracklets being reported; the resultant detections increased by nearly a factor of 5 from the previous run, returning to slightly higher than the previous pre-V3.5 levels.



Where we planned to use this less-aggressive artifact ID rejection as the norm in the future, we continued to make and test the following improvements over the next few days:

- 1) dropping bands 1 & 2 ARTID as discrimination flags for the filtering, since WMOPS only operates in bands 3 & 4;
- 2) testing to see if we can drop latent filtering altogether, and adding that feature to the code;

3) relying on our internal latent checking;

We conducted 6 separate tests to check the effects of each of the above modifications and possible operational conditions.

### Test Summary

Condition of use_cc_flags	Valid tracklets	Rejected Tracklets	Artifar-Rejected Tracklets
1-current ops (across all bands)	781	34	4
1, with band selection(as 2-4 below)	788	34	4
2, rejects all ARTID flags	153	0	0
3, rejects only definite non-latent artifacts	996	52	9
4, rejects all non-latent artifacts	945	14	19

Conclusion: We should run with use\_cc\_flags 3 from now on. The band-selection makes little difference (note the first two tests above), but its good to have it implemented. The change in V3.5 was likely due to the processing, and latent parent-identifications, through the Galactic plane enabled by V3.5 release.

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