Frame Co-addition

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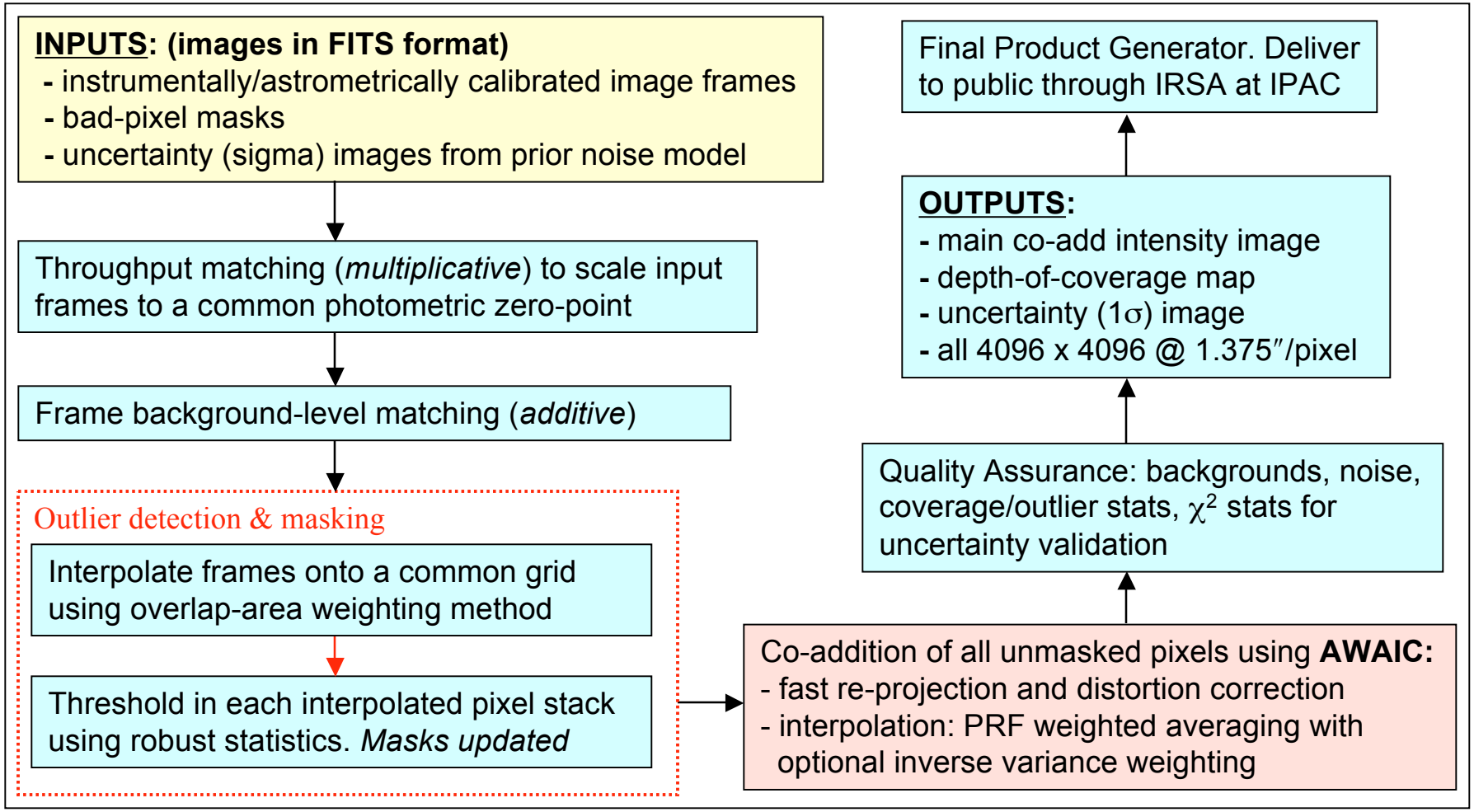
COADD Pipeline Overview

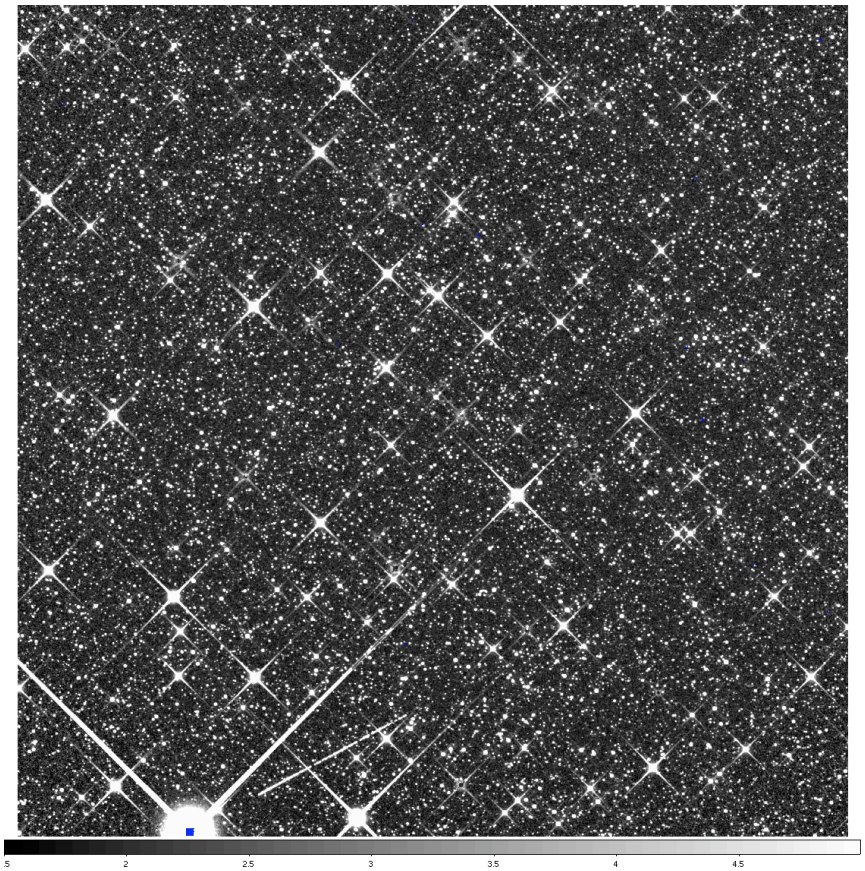


Atlas Images from sims

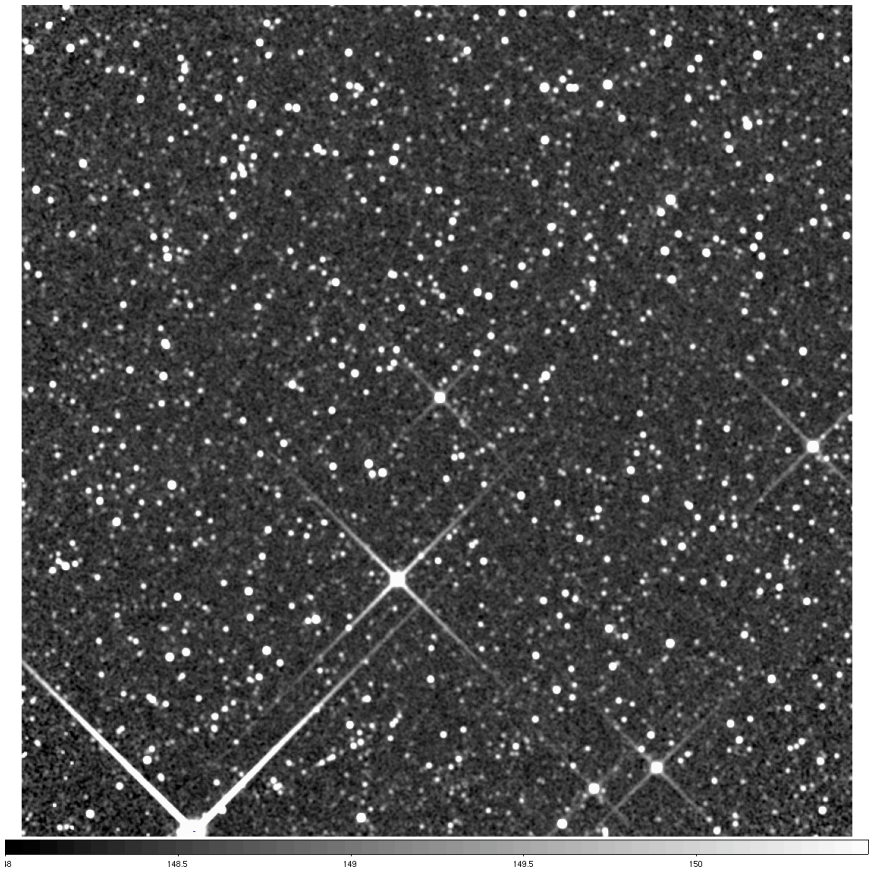
Simulated frames provided by Ned Wright (May'08), processed, then co-added. Field is at $\beta \approx +30°$

1.56°

3.3 µm

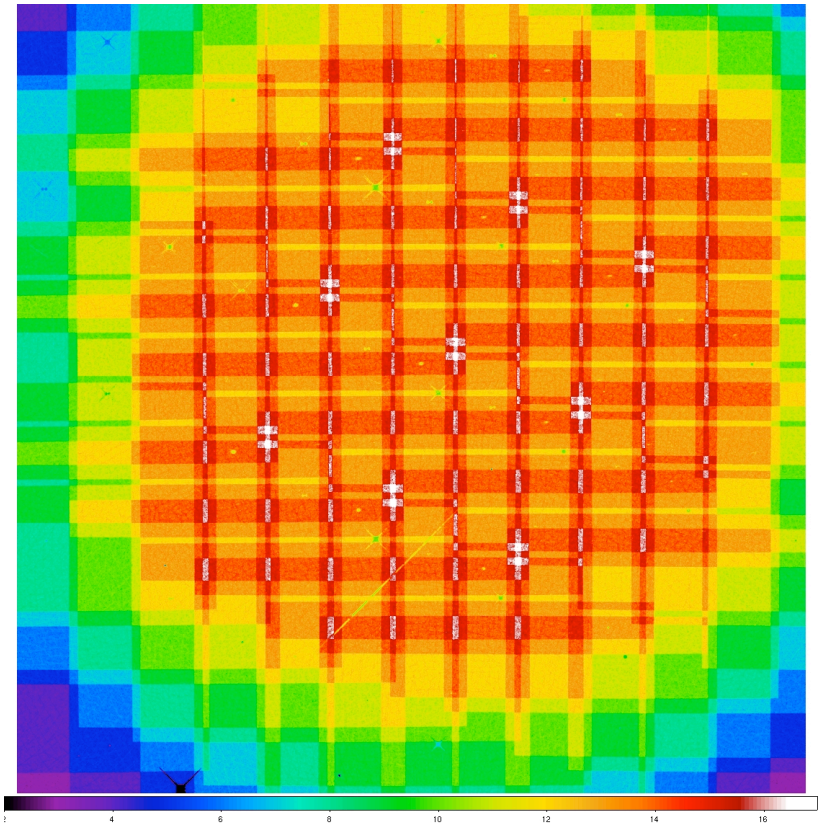


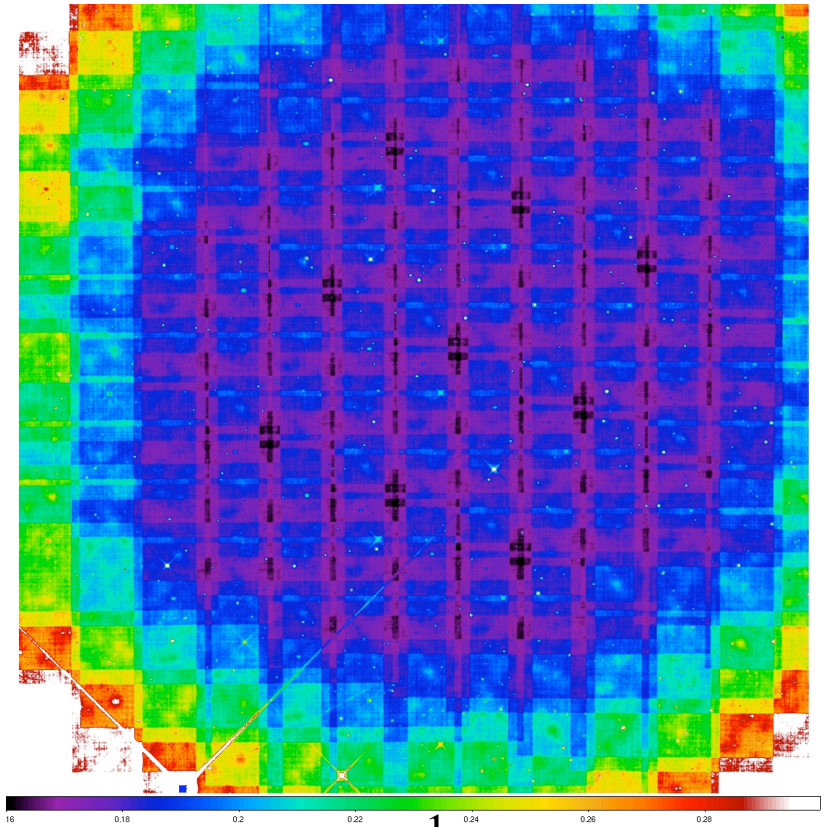
23 µm



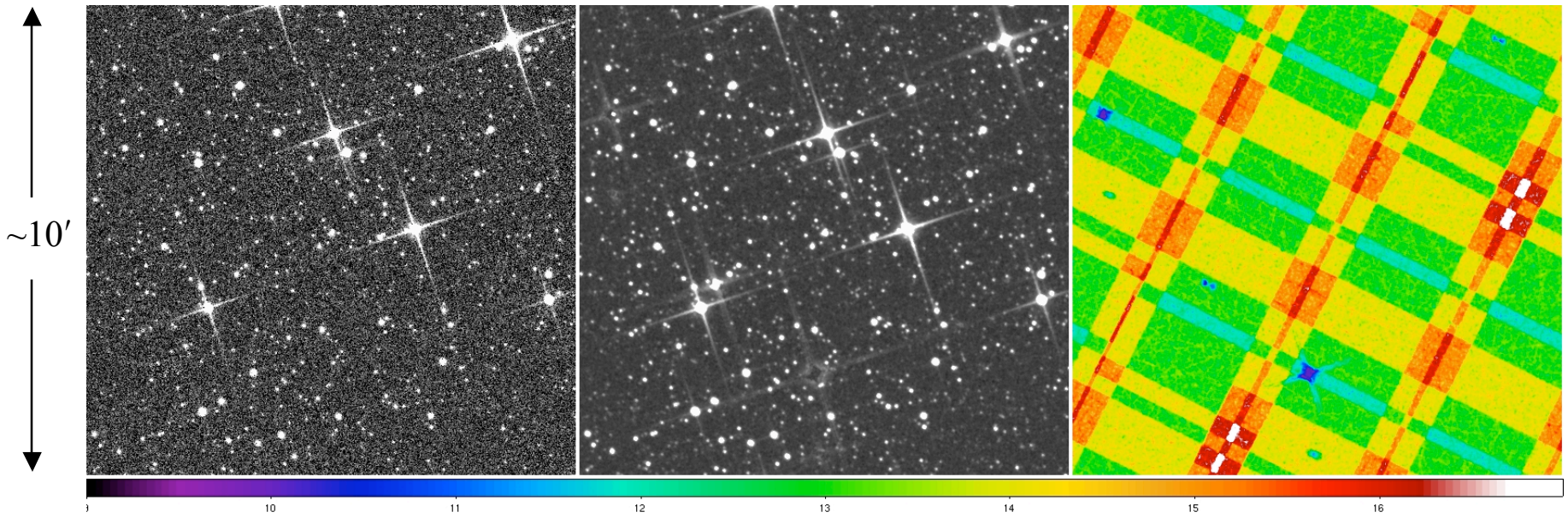
Depth-of-coverage, σ maps

- Depth-of-coverage map: effective number of repeats from all *unmasked* pixels at each location
- σ-map: 1-sigma uncertainty for each pixel propagated from a noise model





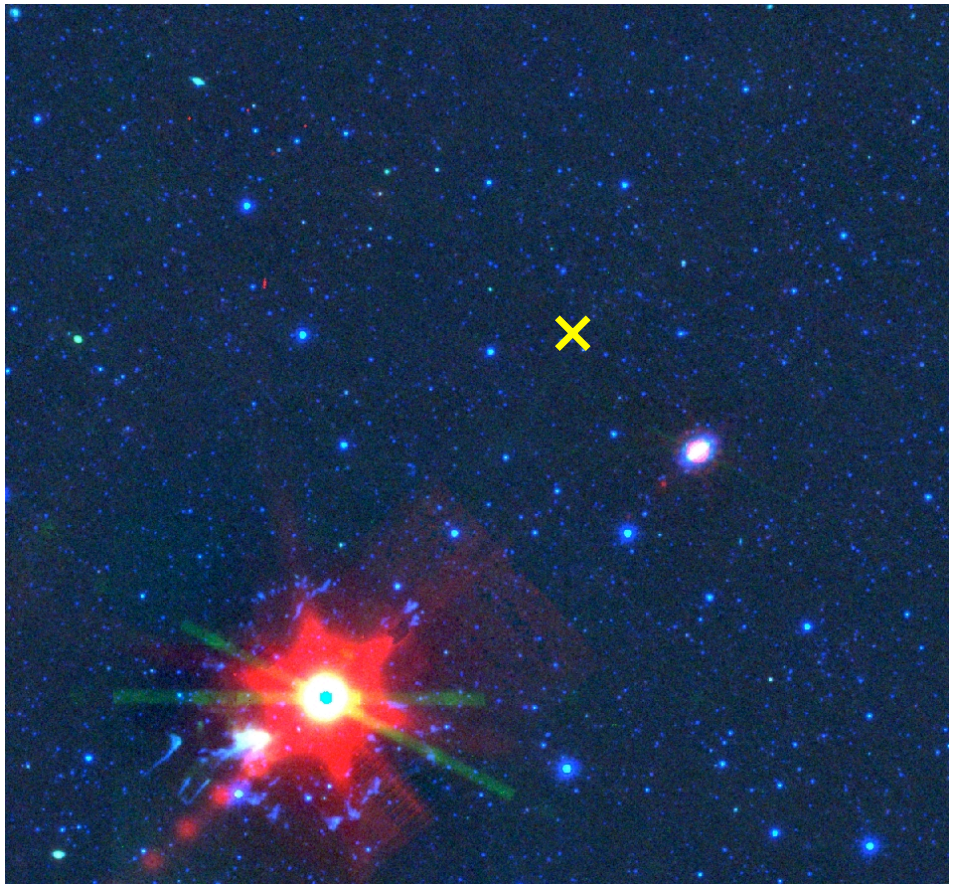
Frame to Co-add zoom-in



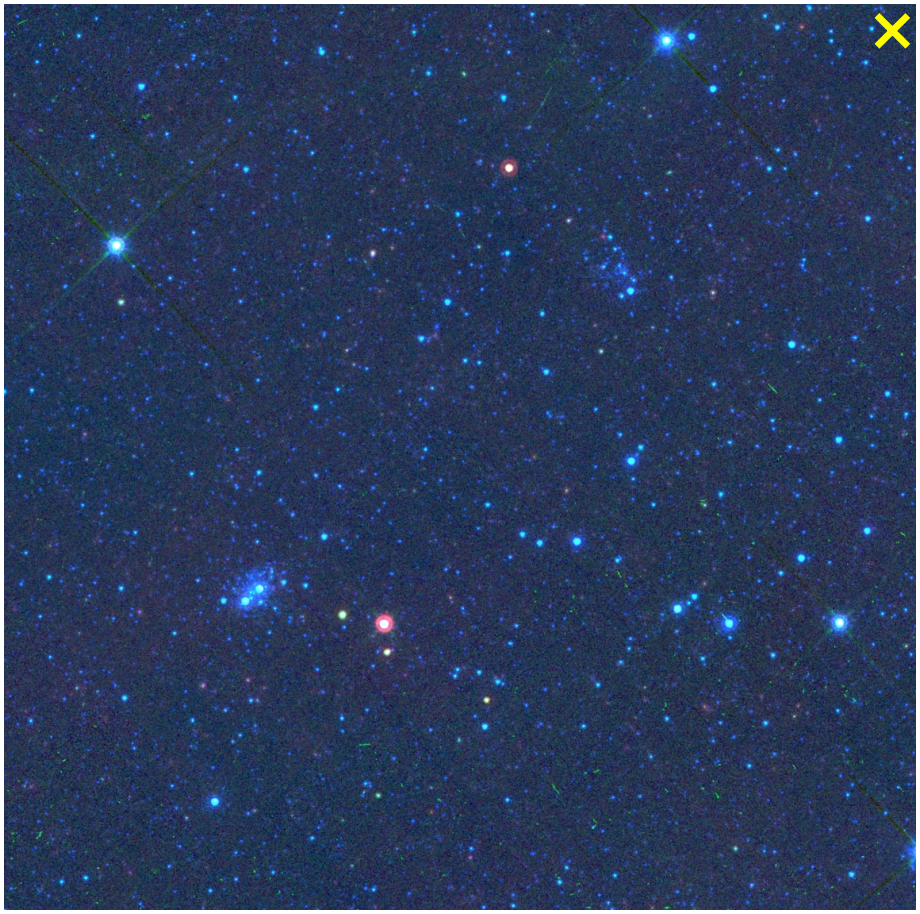
Ecliptic Poles from *Spitzer*

Frame Co-addition

NORTH



SOUTH



4.5μm (blue)
8μm (green)
24μm (red)
} proxy for WISE bands 2, 3, 4

~ 18′ ~ 1/5 of Atlas Image

In closing..

- Average execution time for all steps and nominal Atlas Image sizes (over 70 1k x 1k frames on a 2.7 GHz Linux machine): **~ 11 sec / input frame**

  Breakdown
  - gain (photometric ZP) matching: ~ 0.14 sec / frame
  - background (offset) matching: ~ 0.74 sec / frame
  - outlier detection/flagging: ~ 3.34 sec / frame
  - co-addition: ~ 5.80 sec / frame
  - QA (co-add + frame stack stats): ~ 0.85 sec / frame

- For 12 input (overlapping) frames: **~ 15 sec / input frame** => average time per frame not linear with number of input frames

- ADASS paper describing algorithms (including HiRes extension) in more detail: http://web.ipac.caltech.edu/staff/fmasci/home/wise/awaic_adass08.html