

Ops Concept Status & Questions for SDT

Christopher Hirata

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High-Level Changes

- Overall, relatively little has changed since the 2013 report. We have included some improvements in the spacecraft parameters but made no changes to the overall strategy.
- Some changes have had a modest impact:
 - Field layout, associated changes to the tiling strategy.
 - Incorporation of new moment of inertia tensor.
 - Improved settle time performance (from Eric S.), ongoing discussion of angular momentum budget for slews.
 - Updates to stray light constraints for Earth and Moon avoidance.
 - Have looked at a range of initial RAAN (from 175—236°; example shown here is at 228°)
- We'd like to put some of these details in the January report.

Current Stats

- # Number of observations = 584058
- # Science period start MJD = 60614.000000
- # Beginning of sequence MJD = 60614.000001
- # End of sequence MJD = 62805.171608
- # Science period end MJD = 62805.500000
- # Number of filter changes = 3528
- #
- # Observing time breakdown:
- # Microlensing 357.094382 days
- # Supernova 224.422064 days
- # High Latitude Imaging 488.320374 days
- # High Latitude Spectroscopy 246.795207 days
- # Coronagraph 364.290482 days
- # Unallocated 494.625414 days

Compare: in the 2013 report we advocated GO time of >1.25 years or 457 days

HLS Footprint Discussion

- At the last SDT meeting, a question was raised about possibly moving the HLS footprint to a region nearer to the Equator, such that a larger percentage would be accessible from ground based telescopes in both hemispheres.
- We can't move the whole footprint if we also want to cover the supernova regions.
- The trade-off is a higher sky background due to the zodiacal light.
- A possible example is shown here.

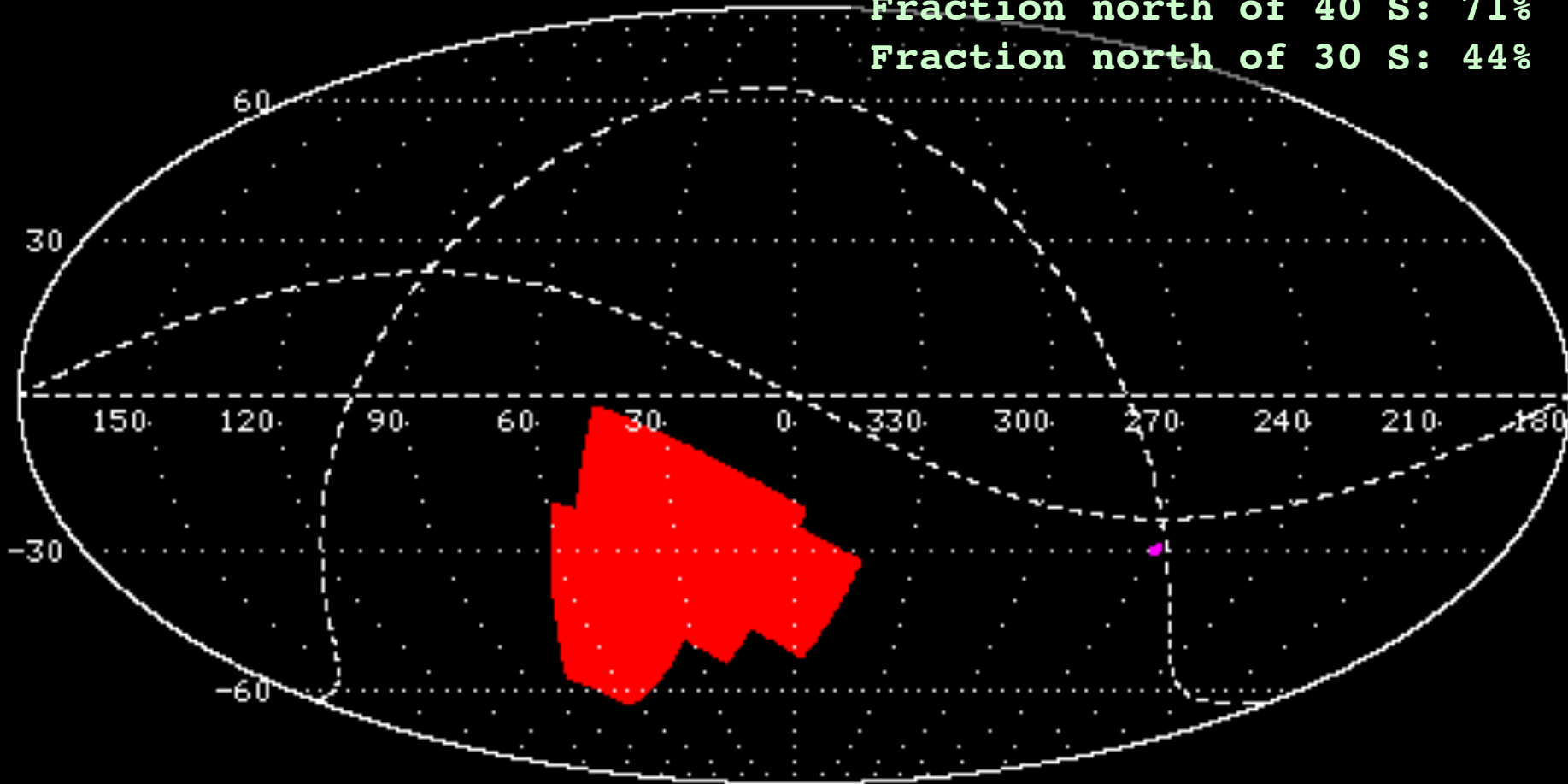
Example Possible Revised Footprint

WFIRST Observation Map: Nobs=584058
Equatorial Coordinates

Area: 2272 sq deg

Fraction north of 40 S: 71%

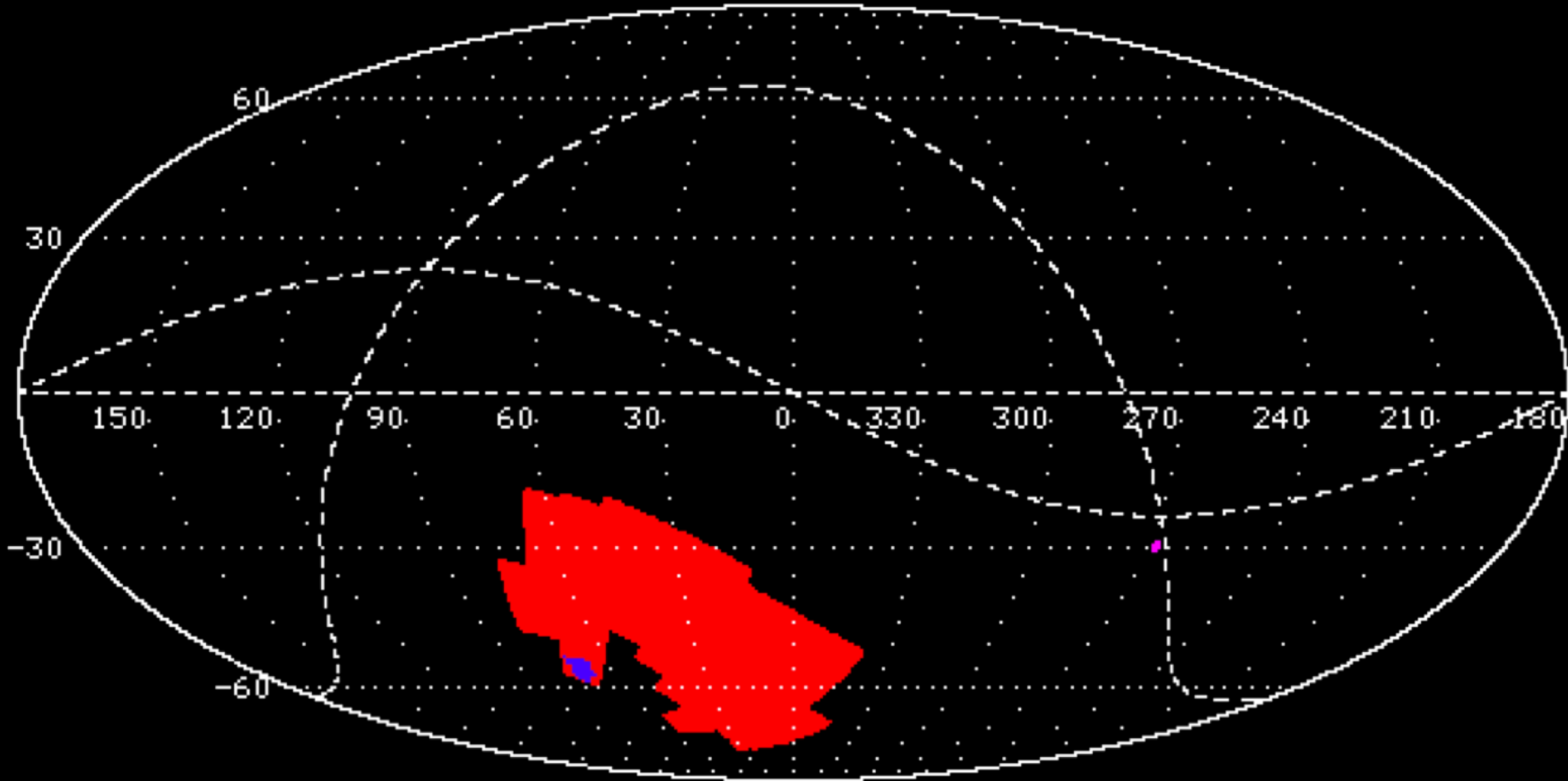
Fraction north of 30 S: 44%



Compare to 2013 Version

WFIRST Observation Map: Nobs=557709
Equatorial Coordinates

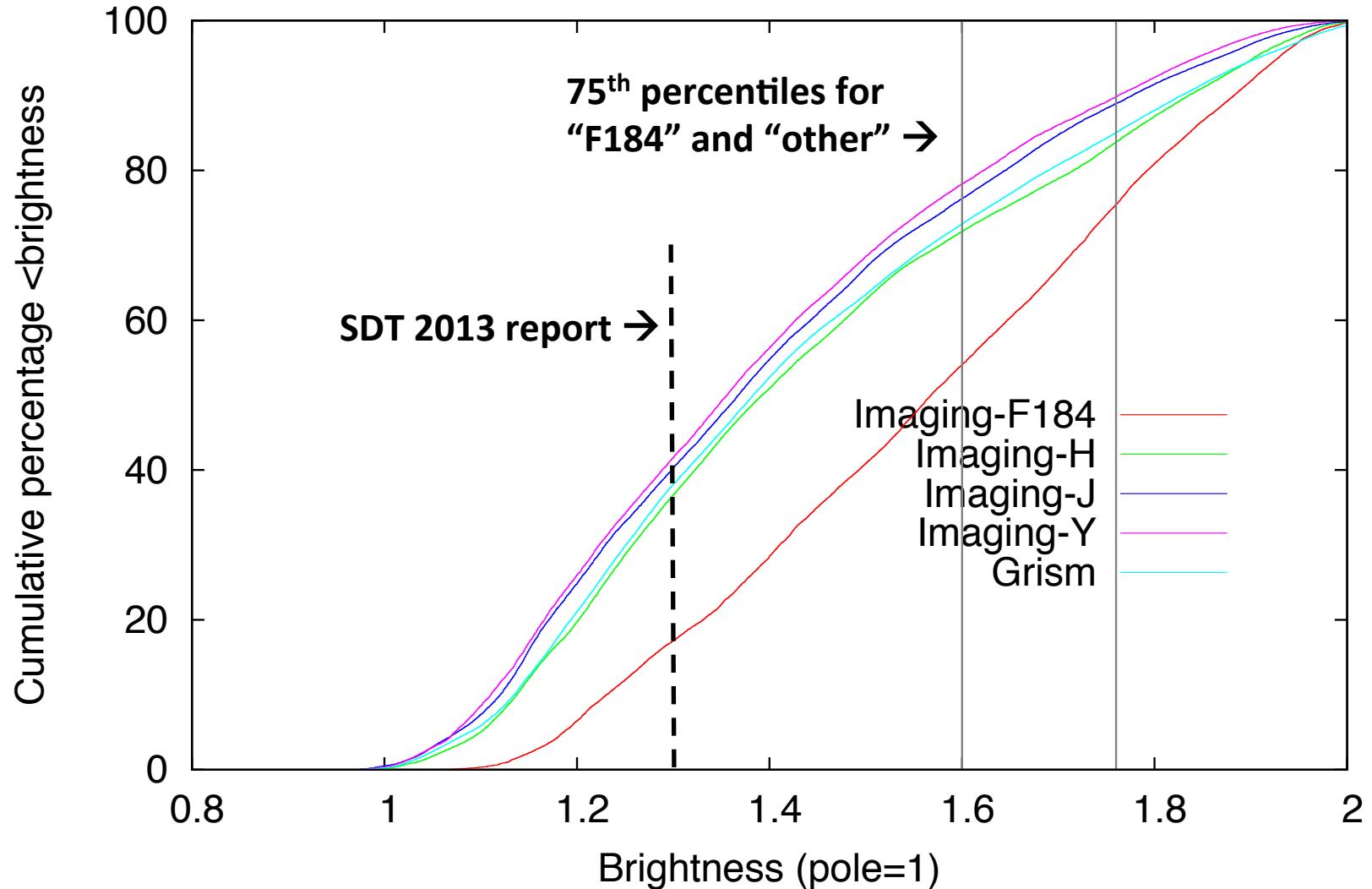
Area: 2054 sq deg



Increased sky brightness

[F184 filter is farthest from zodi limited so was scheduled at lower Sun angle]

HLS Sky brightness distribution



Depth Impact

- The loss of depth is modest because of the significant contribution of read noise (and thermal noise in some filters).
- The “square-root-background” scaling would suggest a loss of 0.11 mag.

- Y band 5σ : 26.71 \rightarrow 26.67 mag
- J band 5σ : 26.78 \rightarrow 26.73 mag
- H band 5σ : 26.60 \rightarrow 26.56 mag
- F184 band 5σ : 25.80 \rightarrow 25.78 mag
- Spectro survey: number of H α emitters reduced by 7.5%.