ECSurv(ey) Status

- Past
- Present (start of 2023)
- Future

R. Scaramella

Past:

— 12 years of work and progress on a quite complex and crucial task for the mission

— many ESA review passed well

— long term problem: understaffed

— highlights: few but dedicated and highly competent people from France, Italy, Portugal

— EC star prize for teams

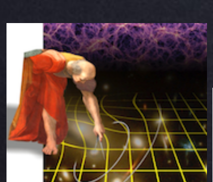
— excellent synergy with ESA (ESSWG team)

— many reports to ESA, EST and EC

Present:

R. Scaramella (lead and EC Survey Scientist)

- Burigana, T. Trombetti
  Zodiacal background model
- J.C. Cuillandre
  S/N, maps, astronomy
- Tereno (deputy)
  Calbrations Analyses
- J Dinis
  algorithms coding



Latest:

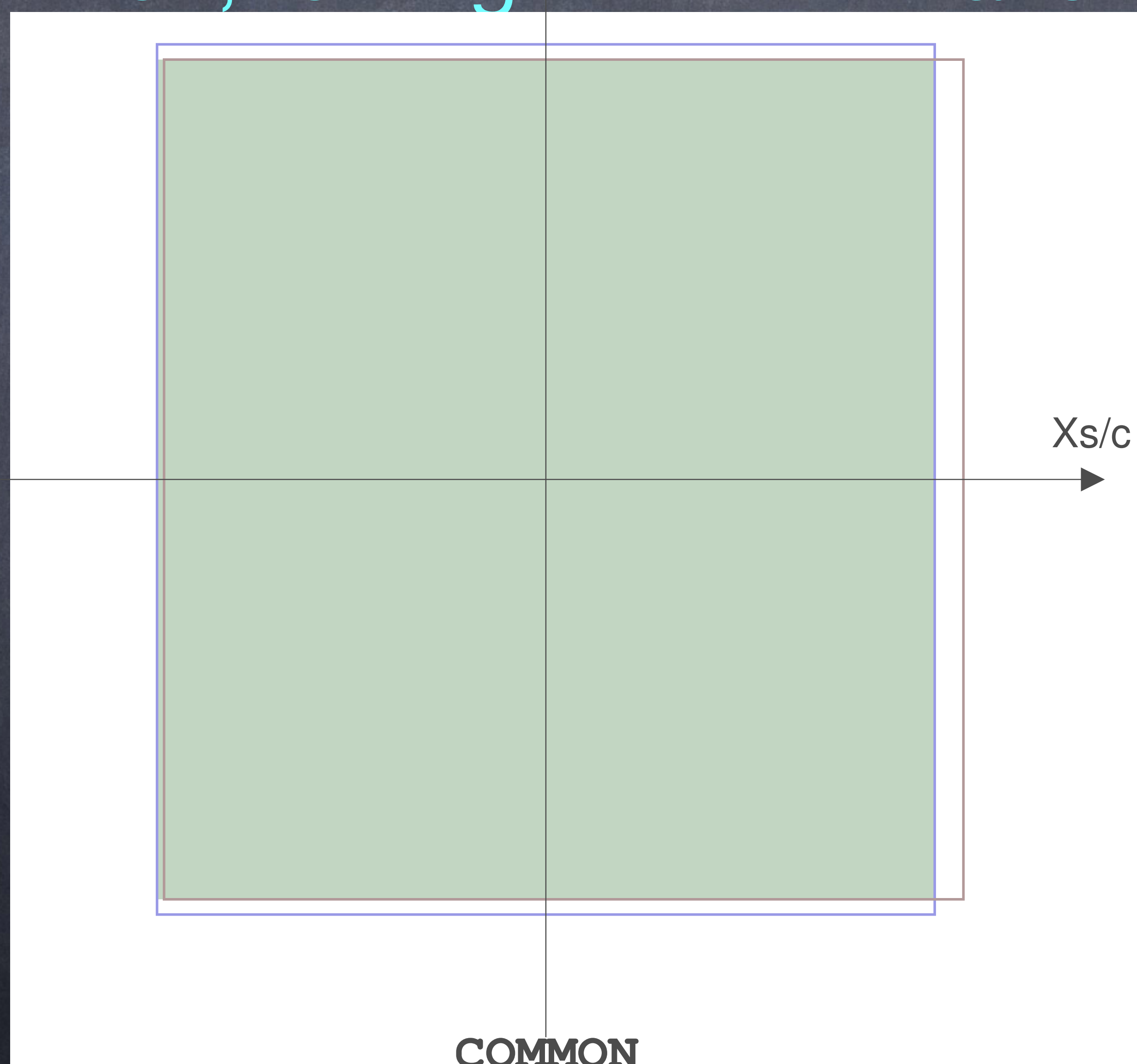
- Focal Plane
- Rubin & footprint (RSD_2022H)
- WFE Campaign

New survey RSD_2022G

Problem: as-built FoV ≠ as planned FoV

new MOCD-A:

- SOP served time halved (12hr —> 6 hr every 4 weeks)
- as built FoV; retiling with minimal overlaps

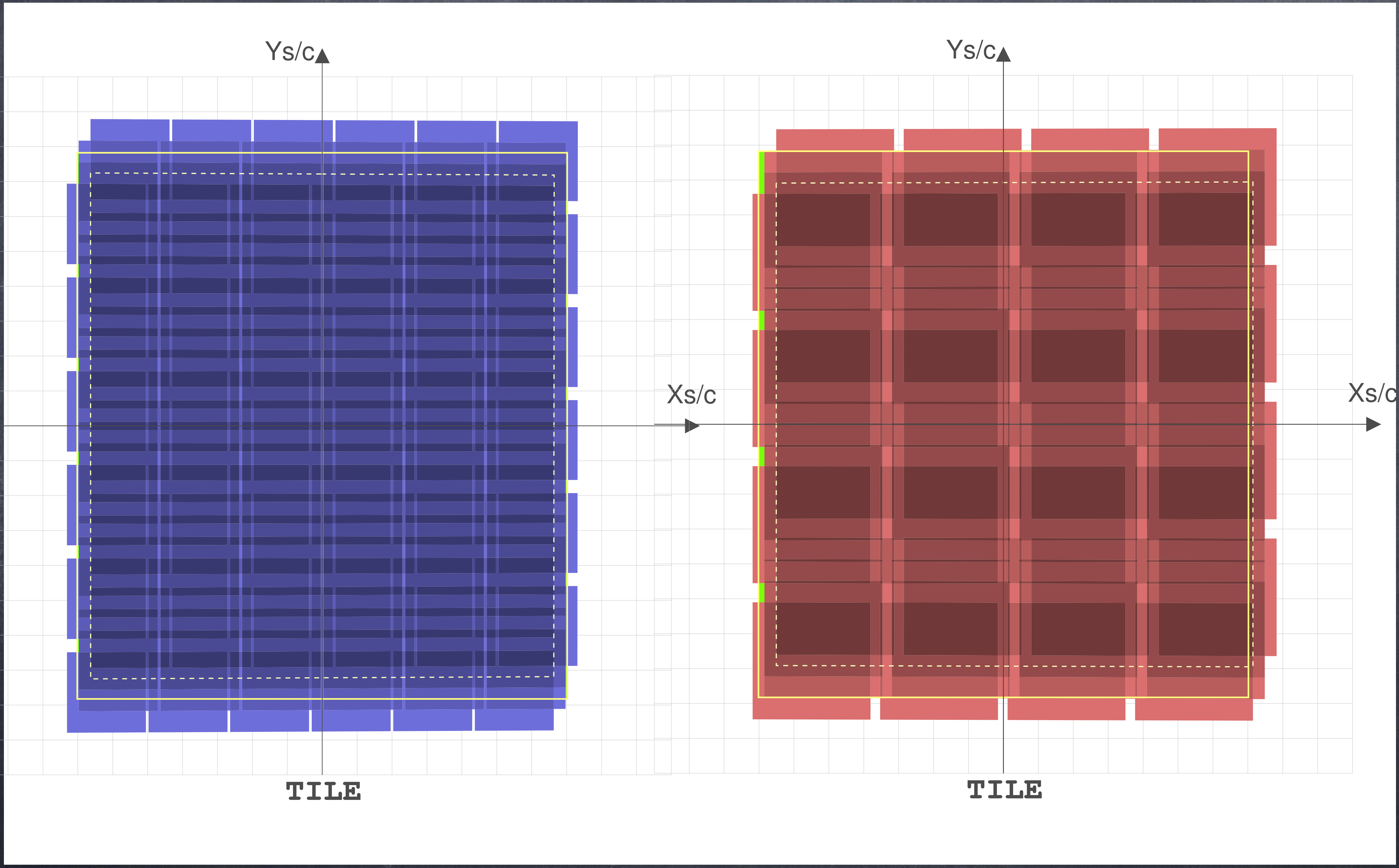


COMMON geometry

corners	$X_{s/c}$[deg]	$Y_{s/c}$[deg]
v[0]	0.470 528	0.376 437
v[1]	0.470 528	−0.376 437
v[2]	1.167 573	−0.376 502
v[3]	1.167 573	0.376 502
center	0.819 050	0.000 000
size	0.697 045	0.752 862
area	0.5248 deg^2	

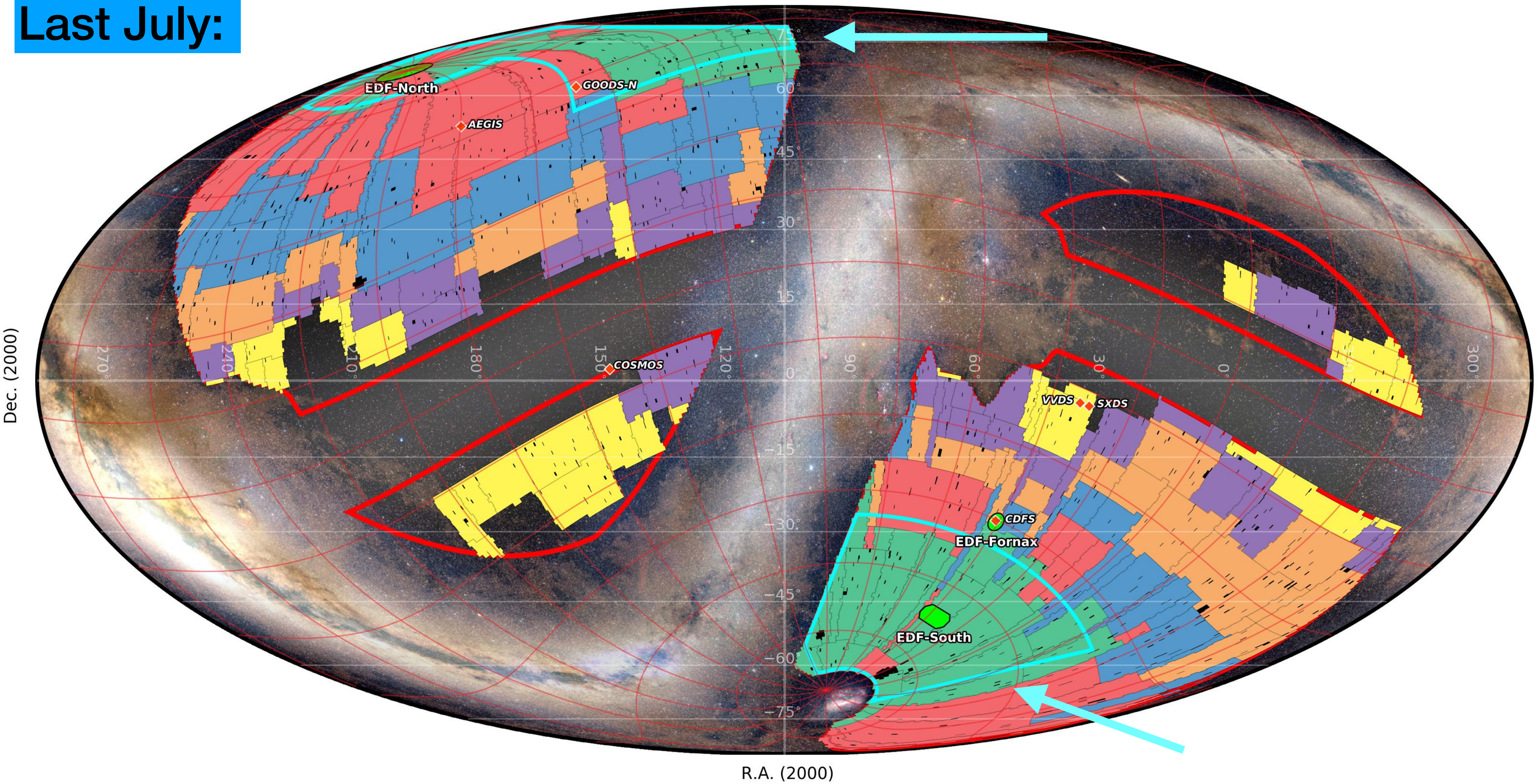
New survey RSD_2022G

MEASURED FOCAL PLANE



J. Dinis

Last July:



RSD 2022g ECTile realization of a Euclid Wide Survey within the 17 Kdeg.^{2} RoI : 14,707 deg.^{2} over 6 years in 254 patches

- Euclid Region of Interest (RoI) : 17 Kdeg.^{2} core science compliant, with 779 blinding spots skipped [black dots]
- Euclid DR1 area 2021 33%−66% average North−South split : 2500 deg^2
- Euclid Deep Fields (EDF, from north to south): 20+10+23 deg.^{2}

Euclid Wide Survey chronology (2.5Kdeg.^{2}/yr)

Year1	Year2	Year3	Year4	Year5	Year6

Background image: Euclid Consortium / Planck Collaboration / A. Mellinger

Plots: J.-C. Cuillandre

wide area: ~14,850 sq deg, (limit is > 14,000)
~150 sq deg in blinding star holes,
net area: ~14700 sq deg

Some regions of Euclid RoI will no longer be covered by Rubin

The Euclid Wide Survey Region of Interest v3

Maximizing overlap with the LSST

Origin: Report based on actions from the Euclid Consortium Survey Group (ECSURV), the Euclid Consortium Complementary Observations Group, the Rubin-Euclid Derived Data Products Working Group, with critical input from the LSST Operations Simulation Team.

Authors: Jean-Charles Cuillandre (CEA Paris-Saclay), João Dinis (Universidade de Lisboa), Peter Yoachim (University of Washington), Roberto Scaramella (INAF), Ismael Tereno (Universidade de Lisboa), Konrad Kuijken (Leiden Observatory), Daniel Stern (JPL), Henk Hoekstra (Leiden University)

Date: January 9, 2023

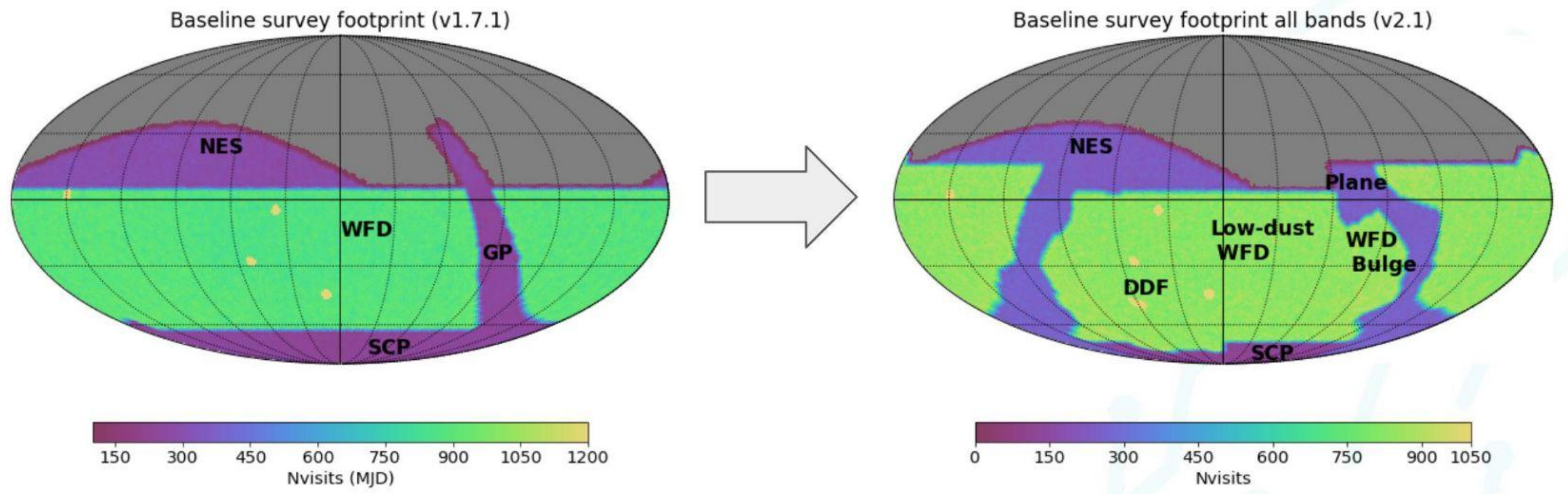


Figure 1: Evolution of the LSST baseline towards the final plan (November 2022). Only the low-dust WFD regions are relevant to Euclid (in green, purple areas are too shallow for Euclid).

—> slightly modify Euclid RoI

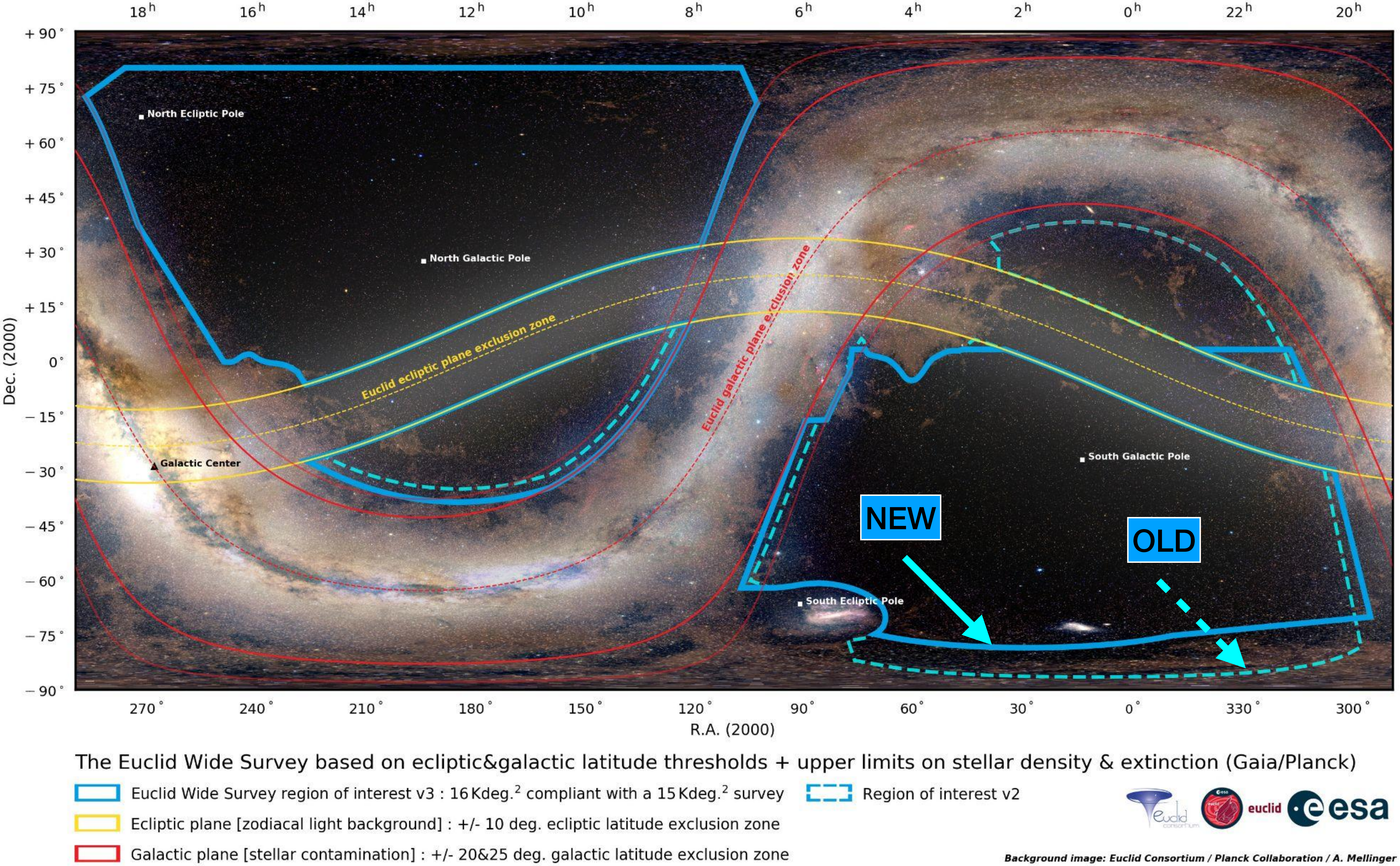
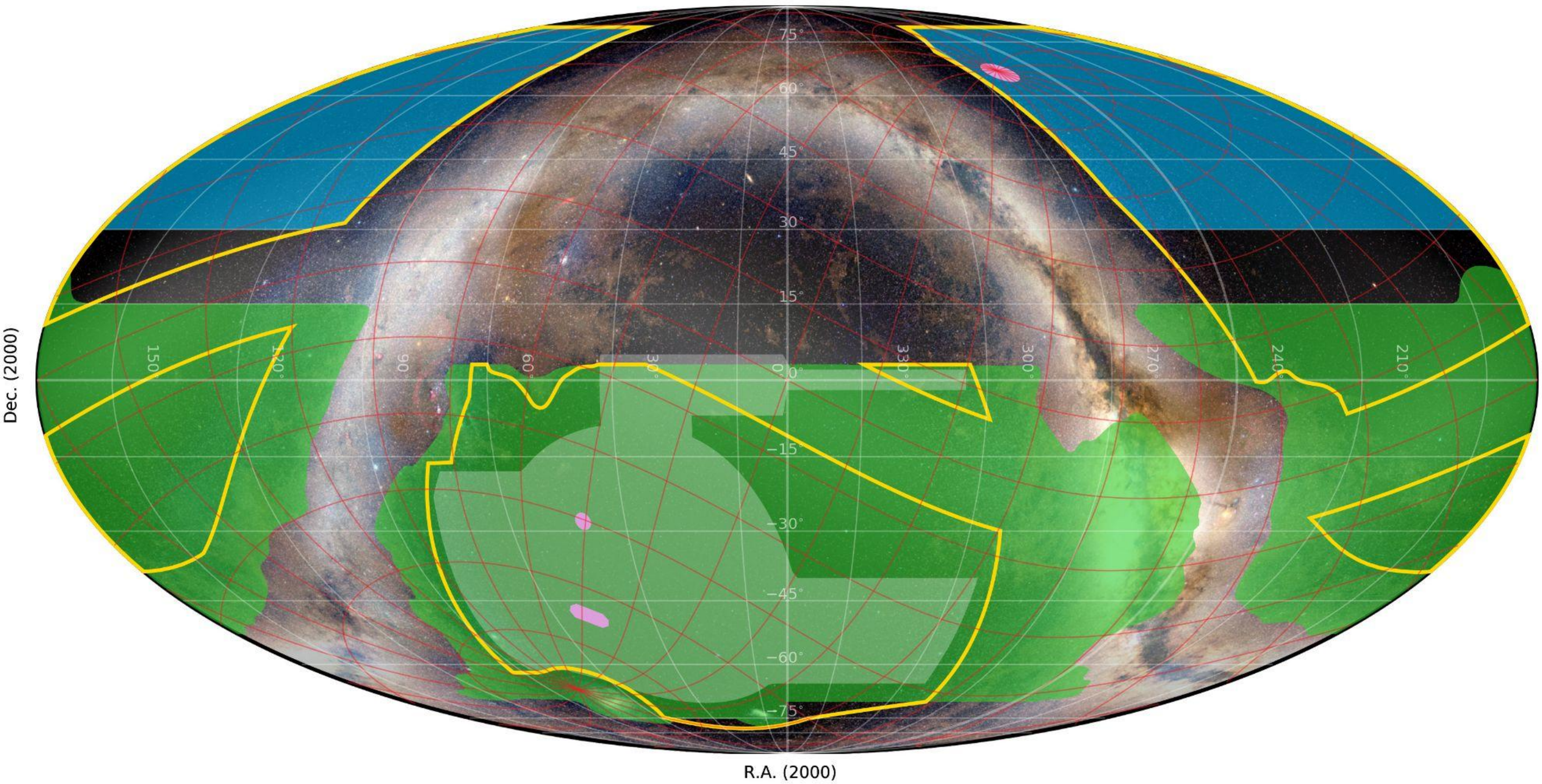


Figure 3: Comparison between the Euclid Region of Interest v2 (dashed) and v3 (solid blue).



Ground−based coverage of the 16 Kdeg.^{2} Euclid Wide Survey Region of Interest [origin/bands/overlap/calendar] [Mollweide Celestial]

- DES (Blanco), griz : 4.8 Kdeg.^{2} overlap since 2019
- LSST Wide−Fast−Deep (Rubin), ugriz : 10.2 Kdeg.^{2} overlap by 2026
- UNIONS (CFHT/Pan−STARRS/Subaru), ugriz : 4.5 Kdeg.^{2} overlap by 2025
- Euclid Region of Interest
- Euclid Deep Fields [total 53 deg^2]

Background image: Euclid Consortium / Planck Collaboration / A. Mellinger

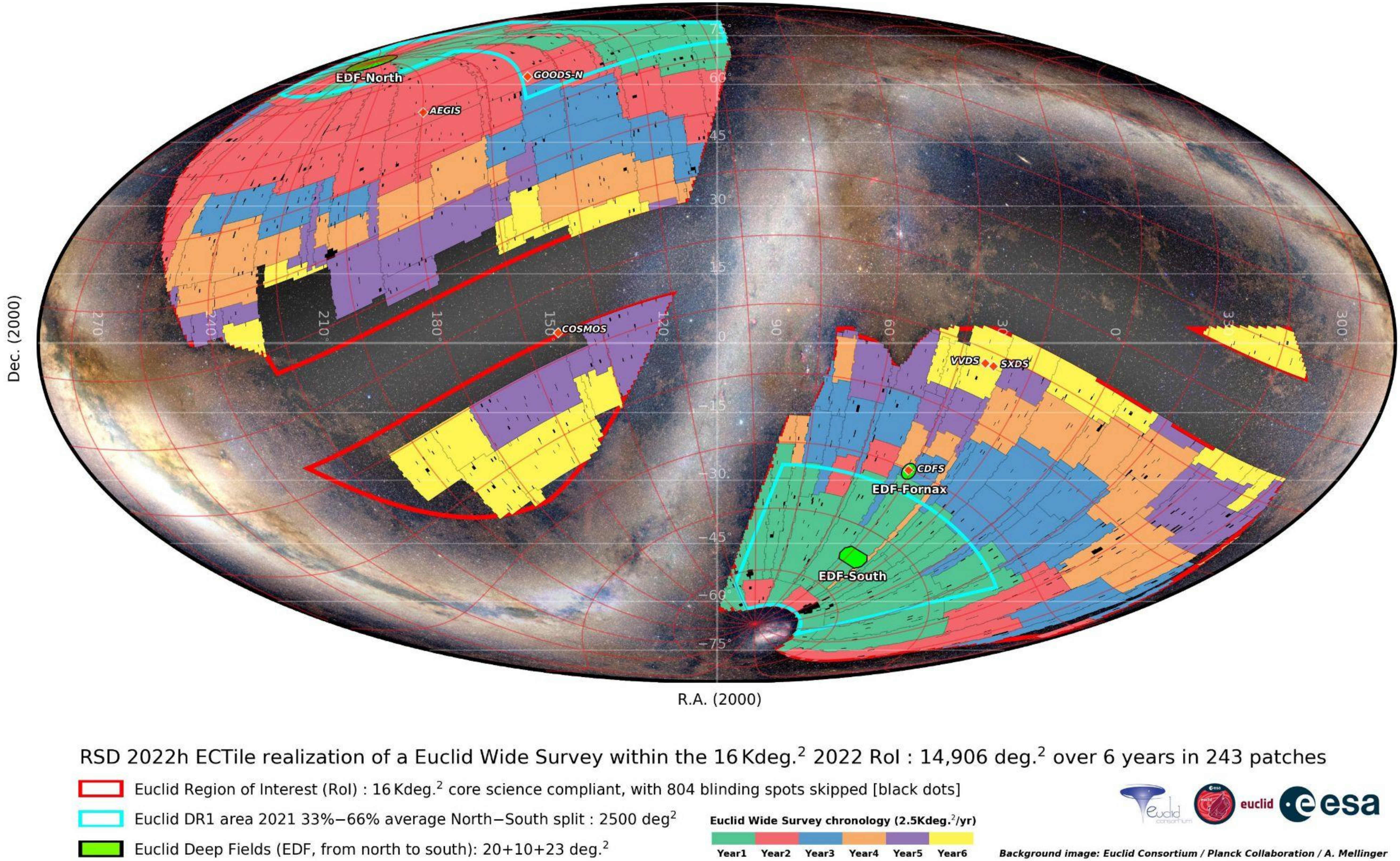
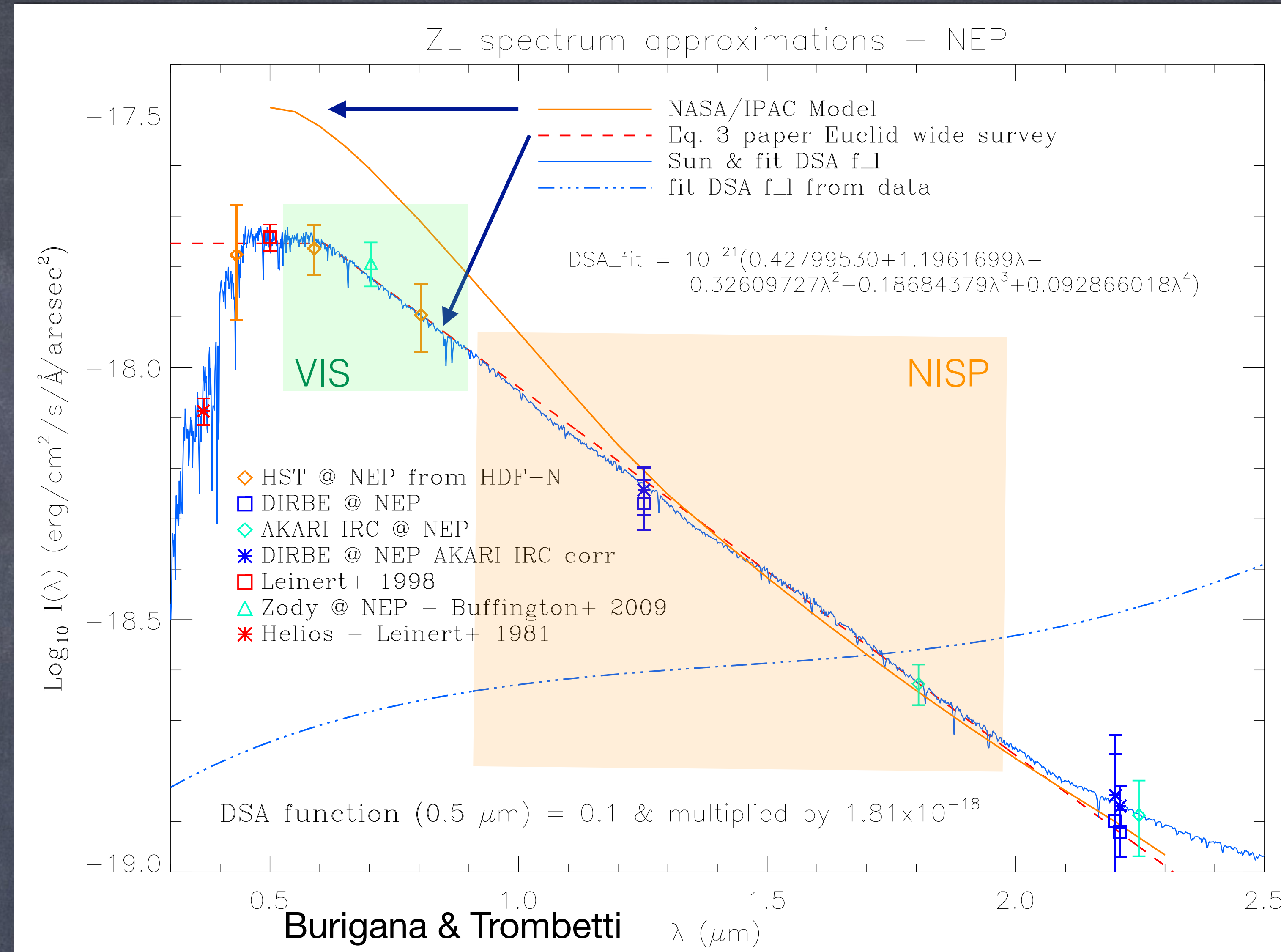


Figure 6: The 2022H RSD fulfills all constraints and is an improvement over 2022G. **+200 sq deg**

Next future:

Survey PV

- Backgrounds
- auxiliary field
- Deep field(s)

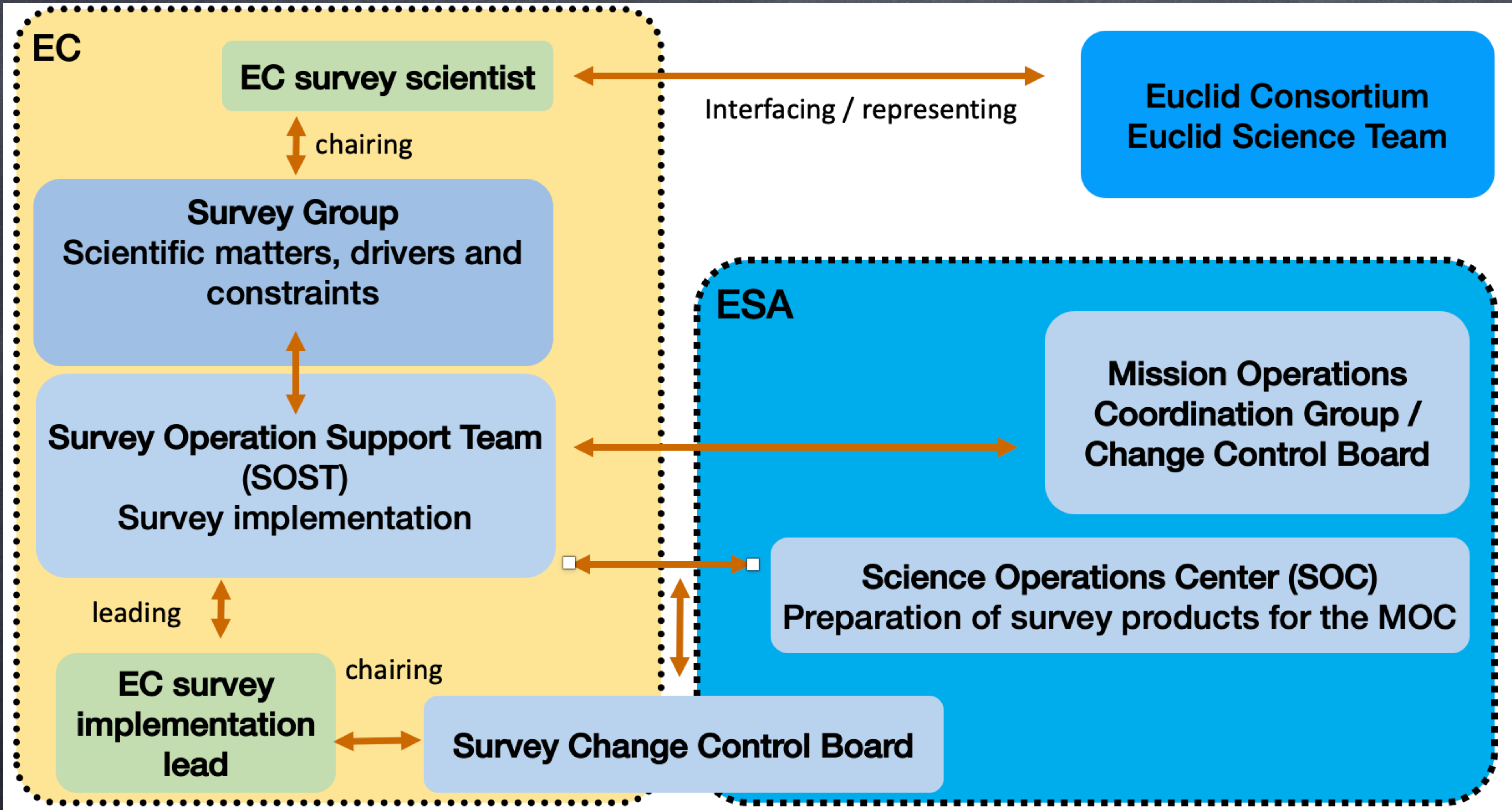


Euclid EROS

EARLY RELEASE OBJECTS (former "Glamorous")
1 day devoted to proposals (~20 ROS). Outreach importance, all data released worldwide at the ed of PV

Short visibility

Future: new SOST (Survey Operations Team) group



Problems for SOST: money, skilled manpower, transition

Wave Front Error Calibration Campaign

Problems:

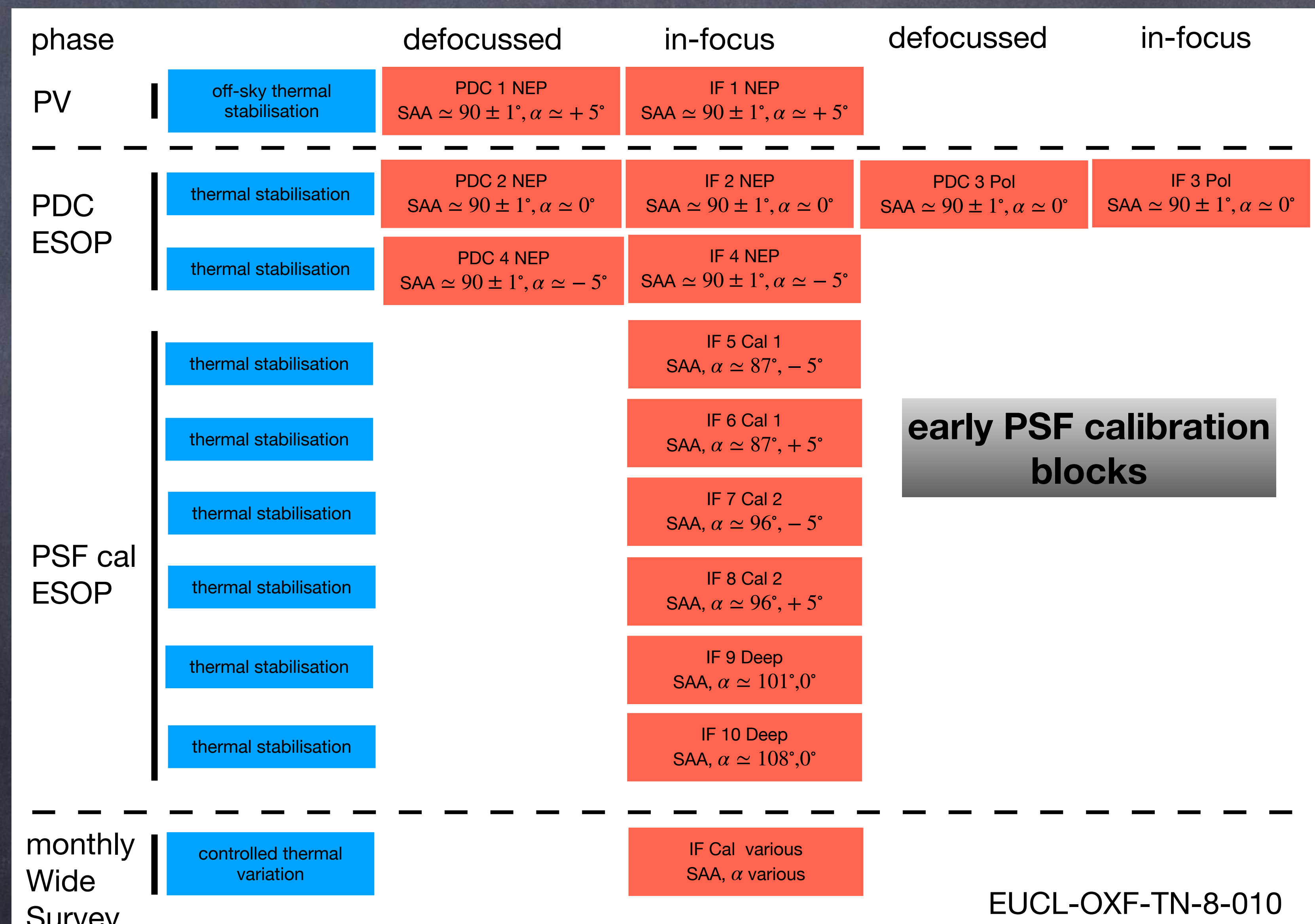
— recently defined

— it takes ~2 months of satellite before the start of the standard survey

— in total several weeks of waiting time for thermalisation

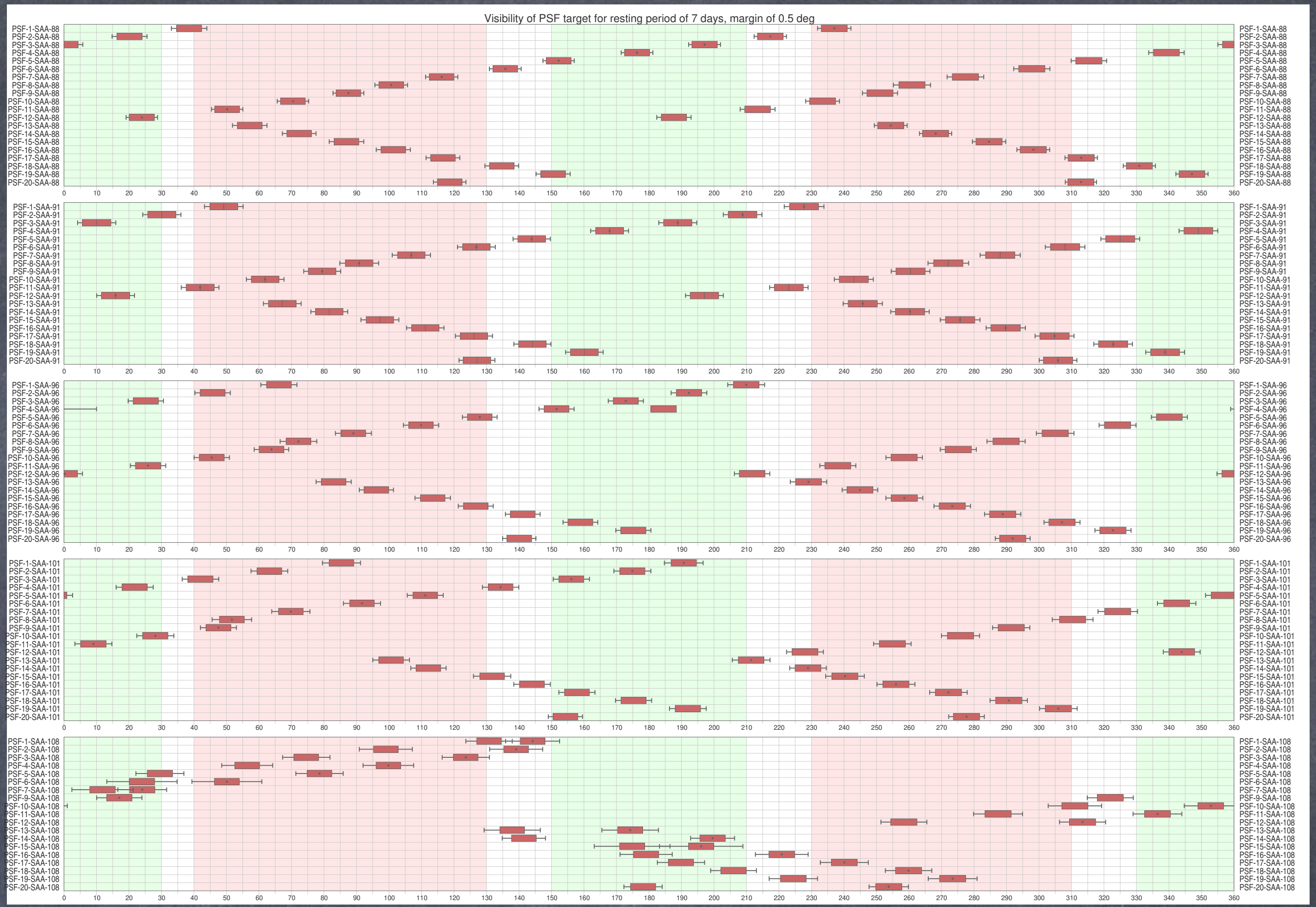
— waiting times are even more constrained than the standard survey

— SOST needs to work out the full solution



EUCL-OXF-TN-8-010

L. Miller



visibility of PSF fields

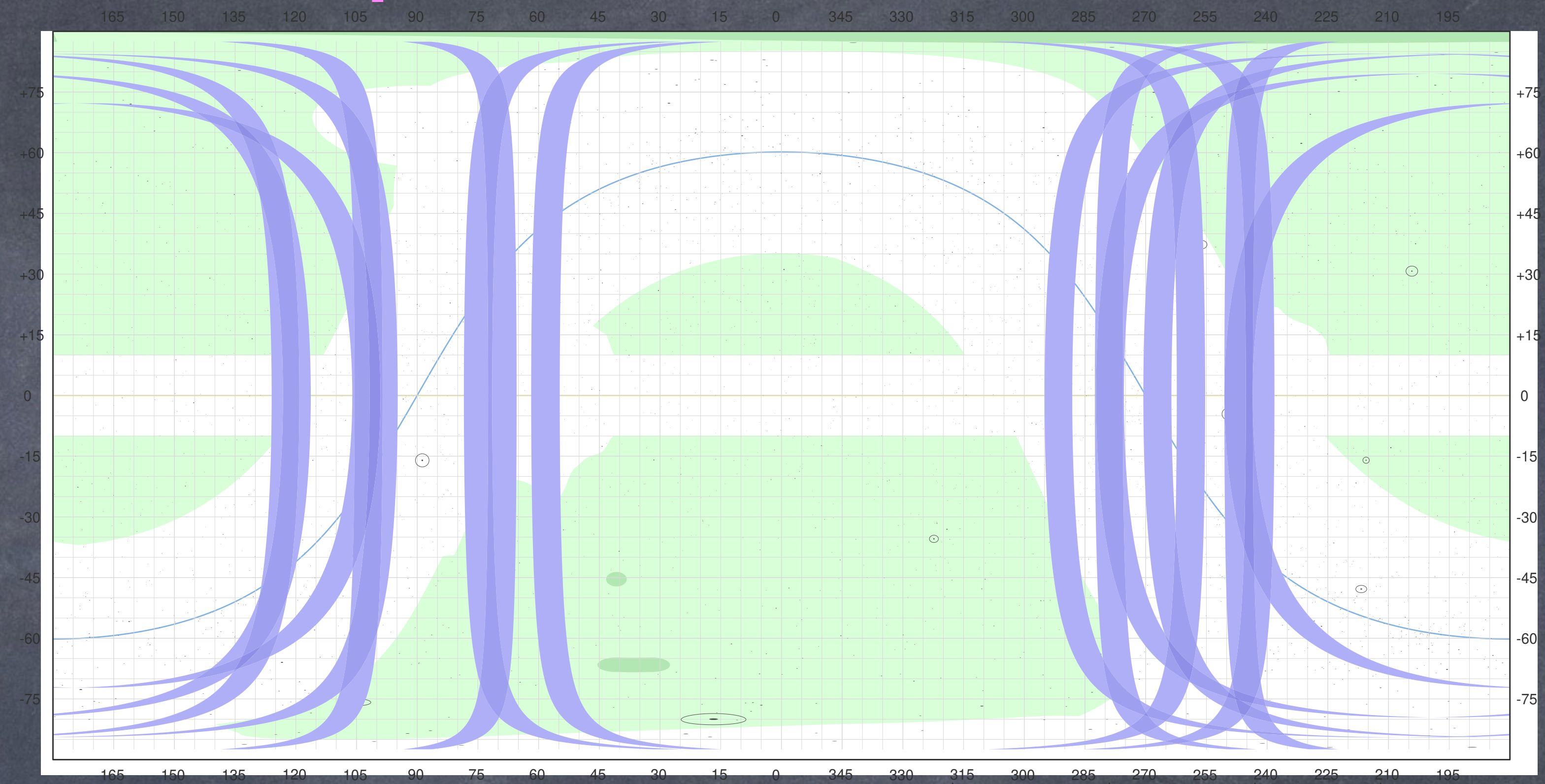
example of viable sequences

ecliptic coordinates

Examples of sky visibility during resting periods

speed of sky is ~1 deg/day at ecliptic equator, smaller at larger latitudes;
— NEP outside for SAA > 93 deg
— galactic center can be visible (with all constraints)

Once calibration is frozen could tap EC for targets (~2 months of highly constrained pointings)



ecl. longitude [deg]	target SAA [deg]	effective SAA [deg]	alpha [deg]	PSF target
326.5 to 334.5	88.0	88.3	-4.0	18
334.5 to 343.4	91.0	91.0	4.0	19
343.4 to 351.3	88.0	88.1	4.0	19
351.3 to 359.2	108.0	107.7	0.0	10
359.2 to 7.1	96.0	95.6	-4.0	4
7.1 to 15.8	91.0	91.5	-4.0	3