

DES PreCam

Rib and Keel Strategy for the PreCam Survey

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Background

We present this alternative proposal for the PreCam strategy which focuses on enhancing the calibration of the DES.

We use the time calculations in the initial PreCam proposal of 8 June 2009 as a calculation baseline.

Beginning with 2% single-pass photometry:

\sqrt{N} gives 0.63% $N=10$ down to 1.0% $N=4$

SDSS Stripe-82 experience shows first 4-10 observations scale as \sqrt{N} .

GOAL: To achieve 1% relative photometry across the grid in the manner of SDSS Stripe-82.

Background-2

- Rather than covering the 5000 sq. deg. once with modest (50%) overlap, which leads to effectively 1 more tiling of the bright end of the DES, we propose a grid of measurements which should be good to better than 1% relative photometry. This grid will be in place prior to the start of the DES and is positioned so that most (if not all) nights of DES observations will touch at least 1 of the proposed stripes.

Background-3

- This maintains the original advantages of the PreCam Survey:

1. Stars from grid are useful for extinction stds.
3. The baseline grid provides a 1% Global Calib.
4. The 1% calib. increases DES efficiency 10%.
5. Aids DES Quick Reduce Pipeline.
6. DA stars at crossing points.
- 7,8. On-sky test of H/W, S/W before DES.
9. Possible observer training.
10. Flat screen testing.

Background-4

- Not maintained or not addressed:

1. Robust overlap with Stripe-82, but there are pointings into the stripe.

Remember goals:

Relative photometry grid,

Can make measure of color transforms.

11. Bright object science only in stripes, not full coverage.

Building the Stripes-1

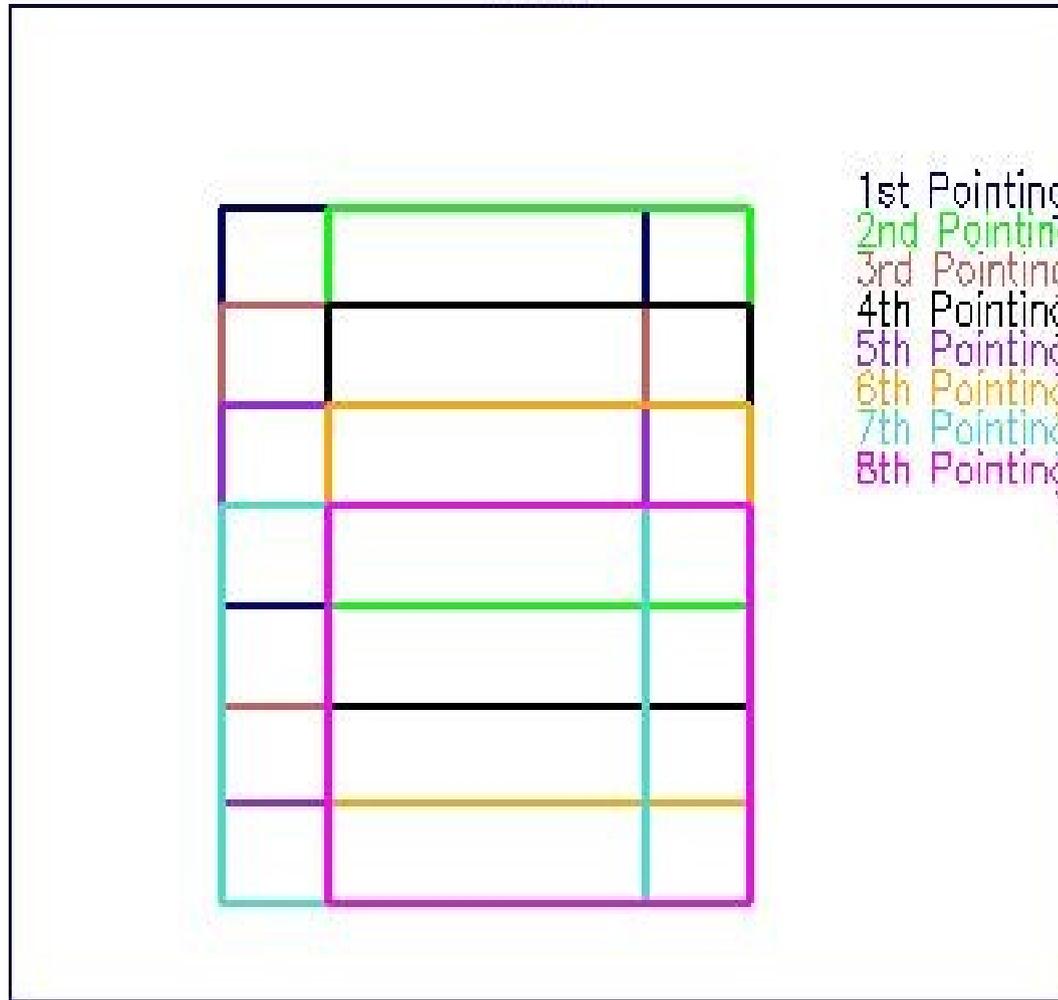
- The baseline plan of 10 exposures.
- Dither by $\sim 25\%$ side-to-side (frames 1,2)
- Dither along stripe $\sim 25\%$ next set of frames (3,4)
- Continue ... this gives a center stripe 1.2 degrees wide with all 4 chips sampling a large fraction of the stars and 10 exposures. A smaller edge of 0.4 degrees on each side with 2 chips and 5 exposures.

Building the Stripes-2

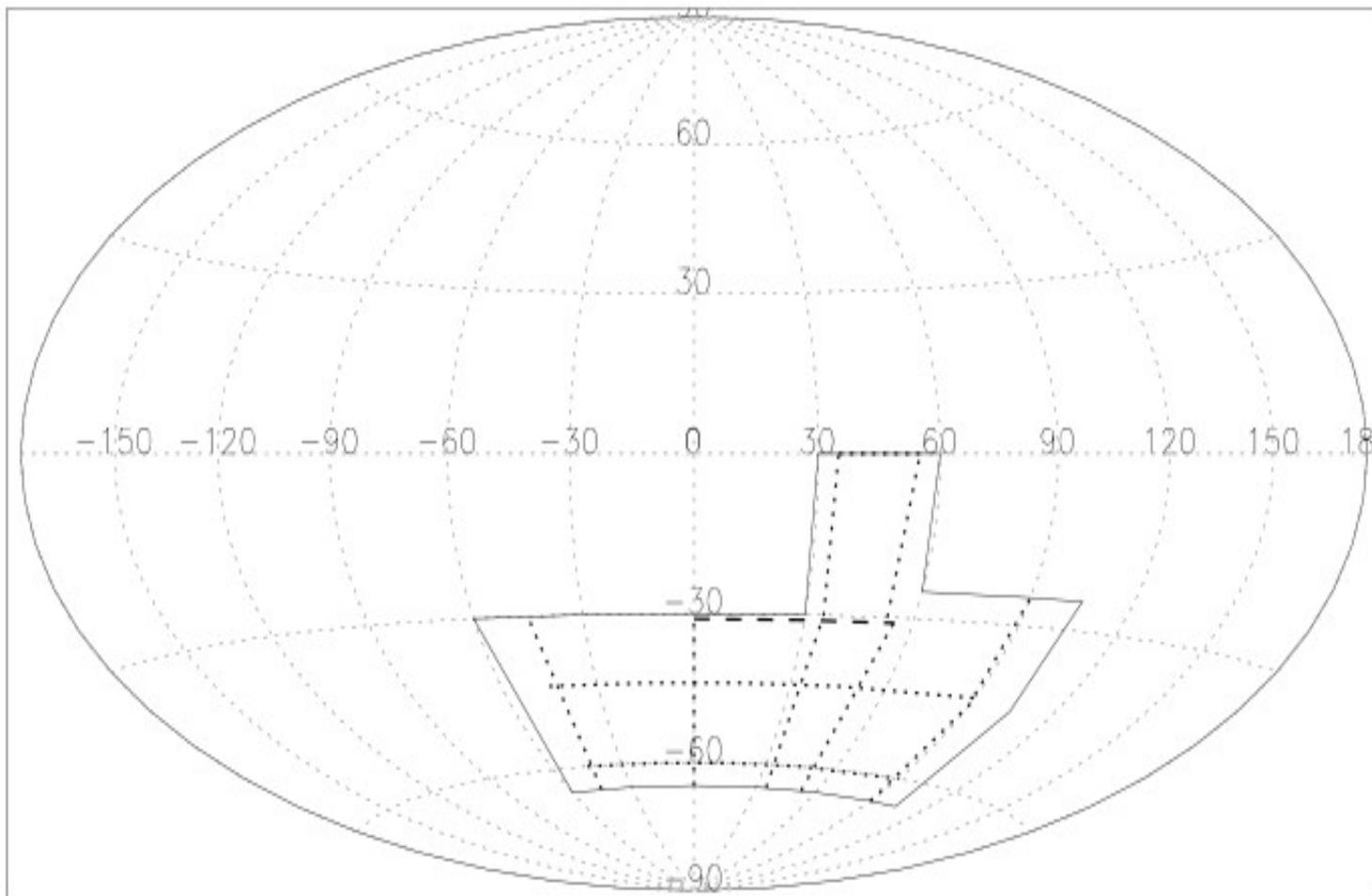
- If the CTIO-SC does not allow 1% relative photometry over the entire field, this narrower stripe can be tailored to make use of the best portion of the field.
- The crossing points of the stripes will be tweaked to put a DA white dwarf in as many as possible.
- Assume 10% of the imaging will have parallel 1.5m spectroscopic observations of the WDs.
- These crossing points will have ~20 shots each.

Building the Stripes

Tiling



Option 1 Cartoon



Option-1

The Original DES Footprint:

Grid of:

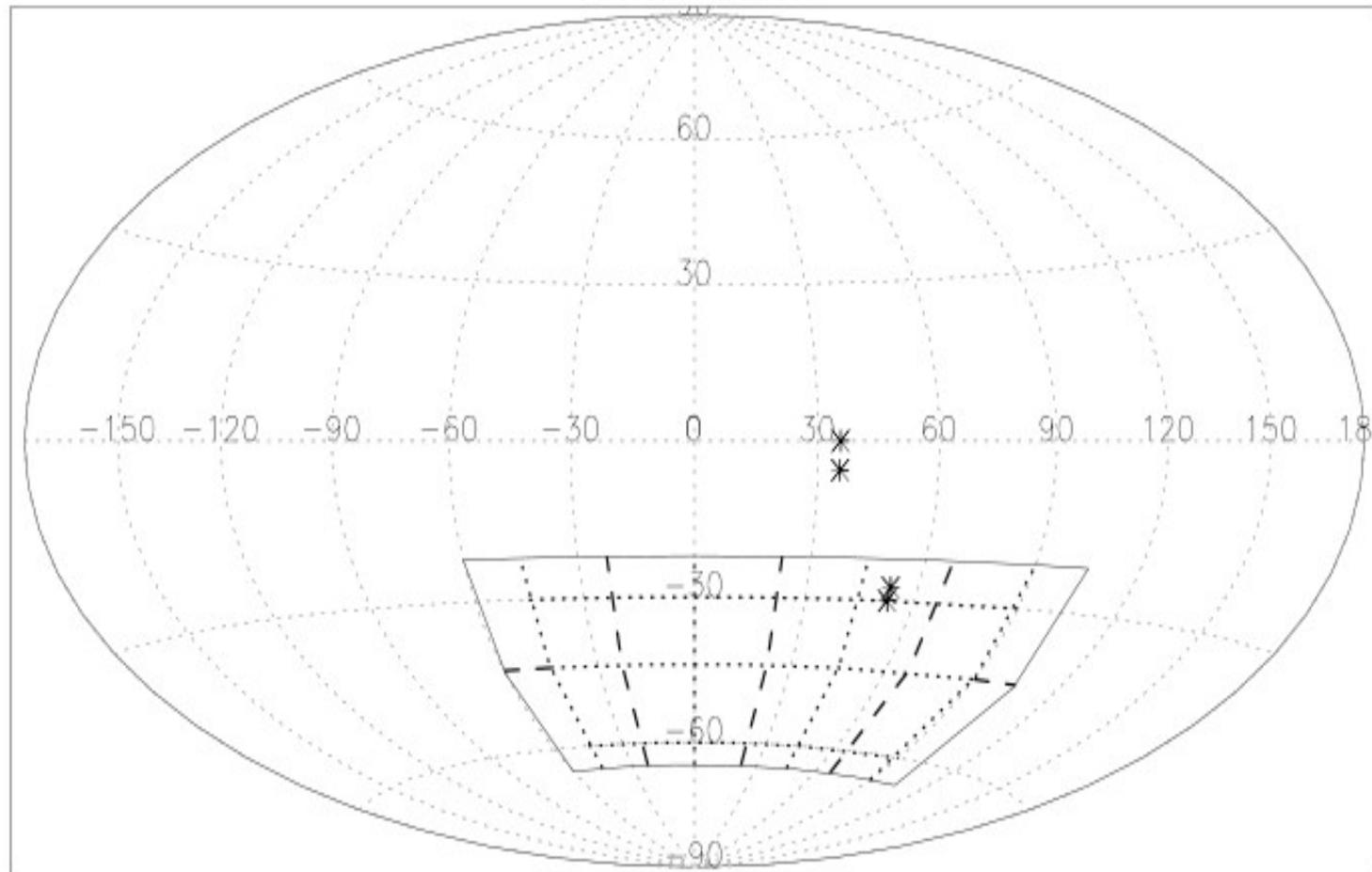
2 stripes in RA stop 15 deg. from E&W edges: Dec
= -43.5, -60

Short RA stripe on stripe-82 ($35 < RA < 55$)

5 full length stripes in Dec.:

RA = -45, 0, +35, +90, one at +52.5/+55 (CDFFS)

Option 2 Cartoon



Option-2

Get rid of the Connection Region and fold it down to the main foot print:

$-60 < RA < 105$ and $-65 < Dec < -22$

Stripe-82 SNe field shifts to W above other 2.

3 stripes in RA stop 15 deg. from E&W edges: Dec = -30, -43.5, -60

4 full length stripes in Dec.:

RA = -45, 0, +45, +90

Stub at RA = 52.5 from $-30 < Dec < -27.5$ (CDFS)

Non-connected stub RA = 35.5, $-5.5 < Dec < 0$