COSI
A Gamma-ray
Space Explorer

COSIpy Meeting -

TS Map – Mini-DC2 & Multi-resolution

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Data & Detector Response in Mini-DC2

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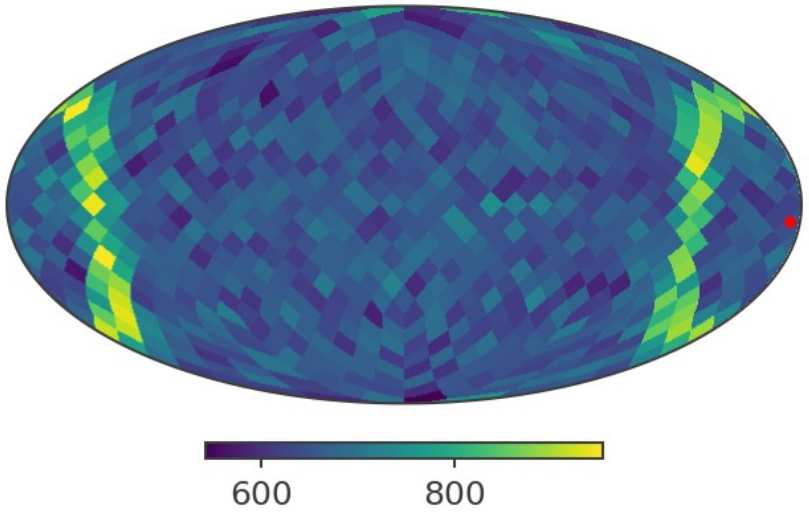
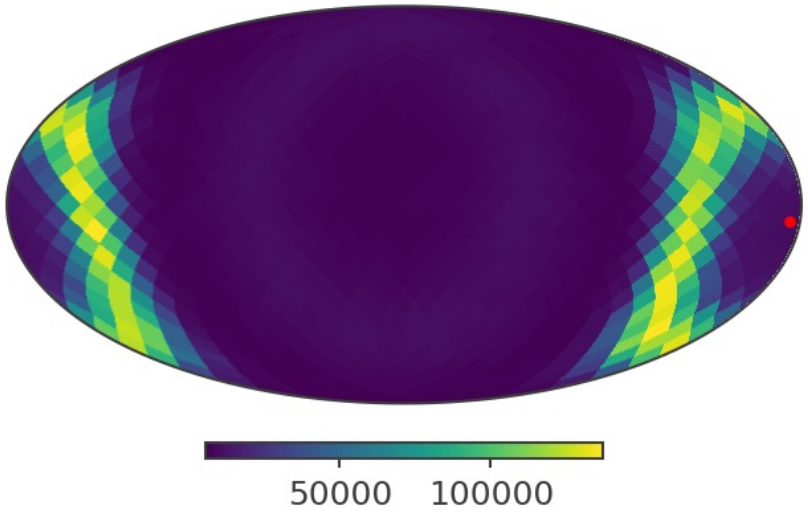
- SRC: "Crab_2hr_binned_data.hdf5"
  - Produced by "crab_dataIO_config.yml" + " GalacticScan.inc1.id1.crab2hr.extracted.tra.gz "
- BKG: "Cosmic_diffuse_2hr_binned_data.hdf5"
  - Produced by "bkg_dataIO_config.yml" + " Cosmic_diffuse_2hr_unbinned_data.hdf5"
- Point Source Response: "psr_miniDC_crab_2hr_gal.h5"
  - Using .slice[{'NuLambda':coord_pix}] & PointSourceResponse() to replace get_point_source_response() method in full detector response case

SRC + BKG



PSR



TS Multi-resolution Map

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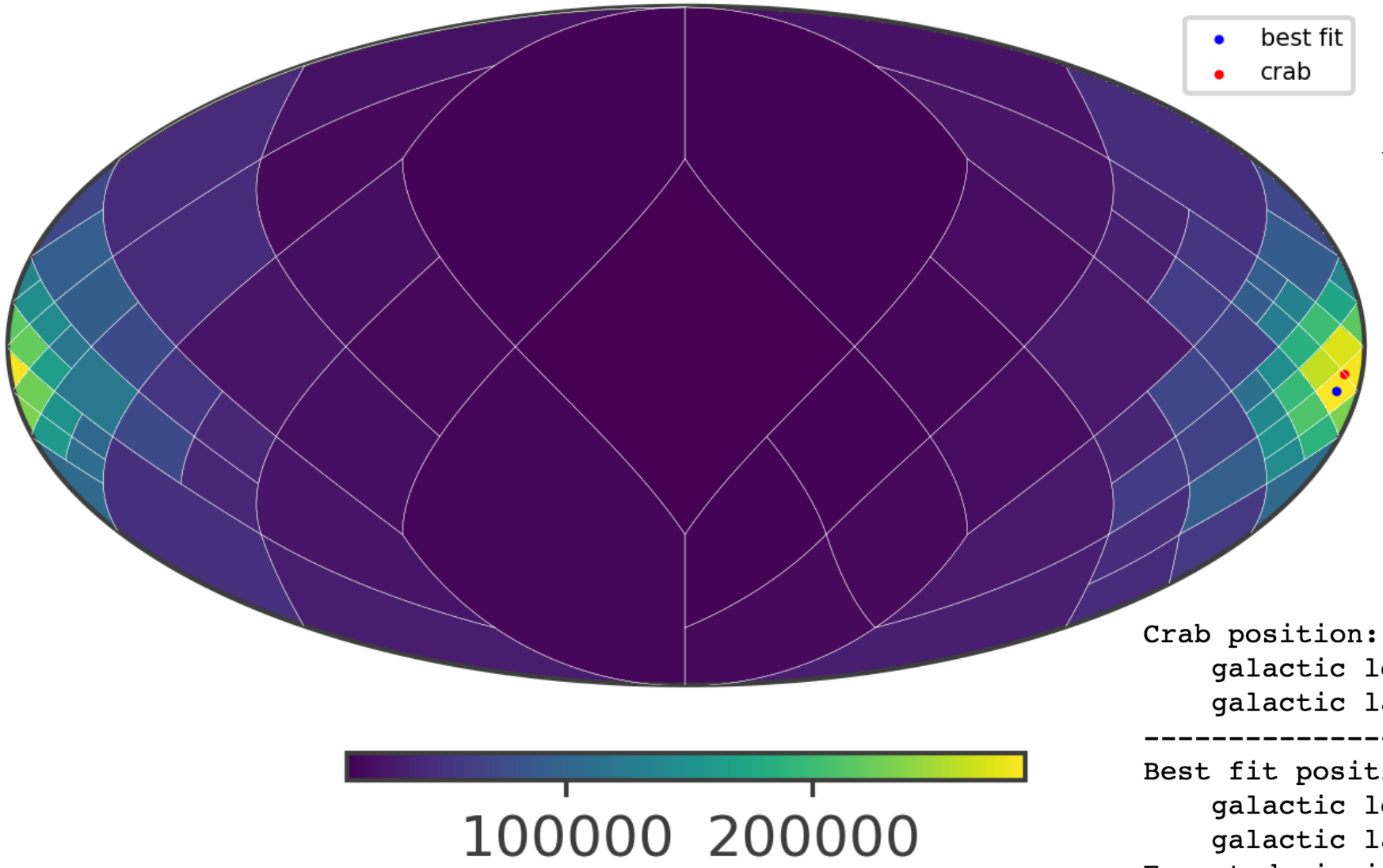
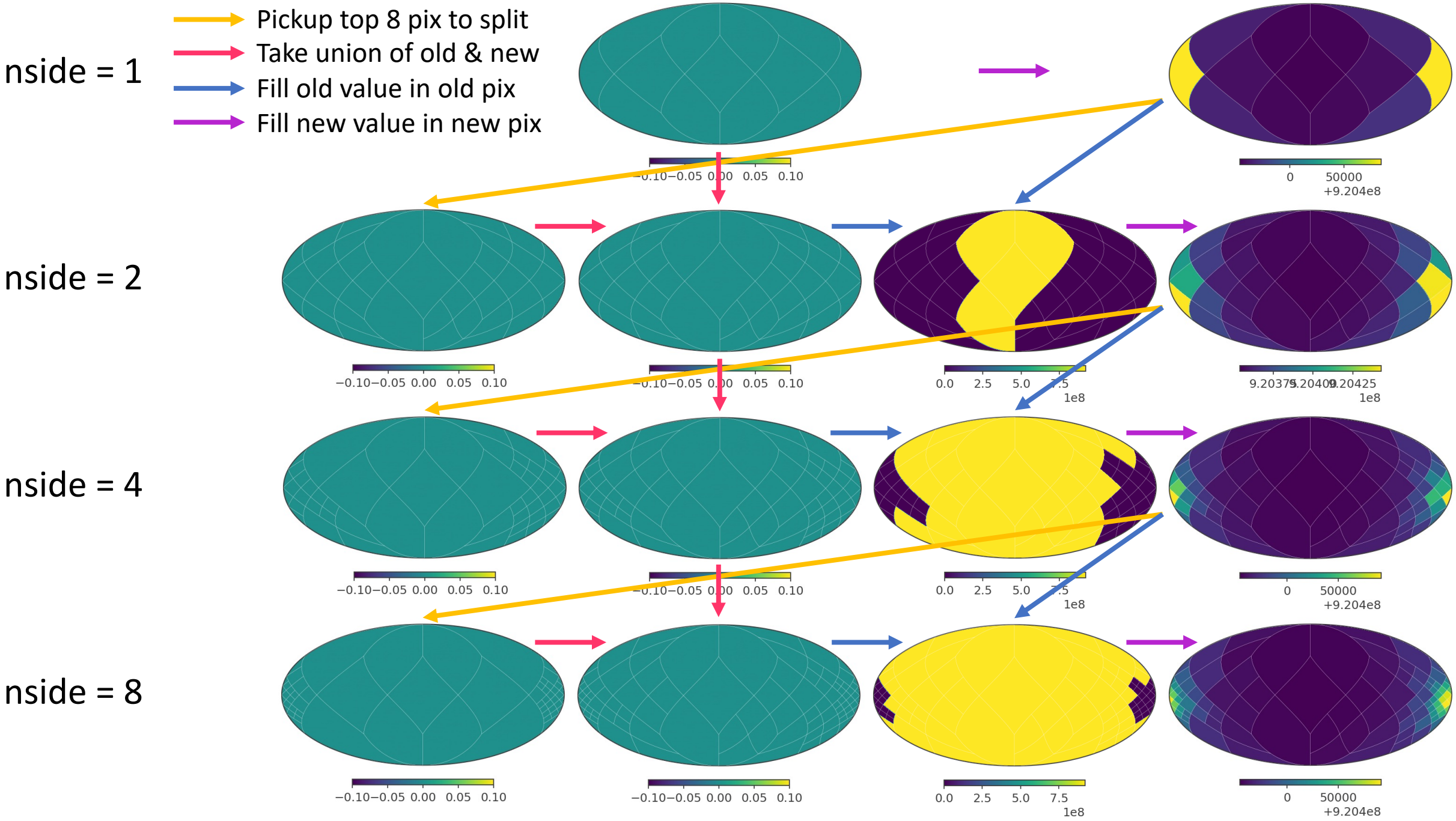


- Advantage:
  only need to run 108 times fitting
  (single-resolution map with nside=8 has to run 768 times fitting)

```
Crab position:
    galactic longitude (l) = 184.5551014904497
    galactic latitude  (b) = -5.78768203451836
-------------------------------------------------
Best fit position:
    galactic longitude (l) = 185.625
    galactic latitude  (b) = -9.594068226860458
Expected significance: inf sigma
```


Pickup top 8 pix to split
Take union of old & new
Fill old value in old pix
Fill new value in new pix
nside = 1
nside = 2
nside = 4
nside = 8
−0.10 −0.05 0.00 0.05 0.10
0 50000 +9.204e8
0.0 2.5 5.0 7.5 1e8
9.20375 9.20400 9.20425 1e8

Further Work…

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- Plot the 90% confidence level by Wilks theorem and constrain the location to a pixel.
- Update TSmap & COSILike class in cosipy.