

2017-02-28 Revision of Analysis

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Beginning of the Revision

2017-02-24 e-mail from cpo

O'Grady, Paul Christopher
Fri 2/24/2017 12:16 PM
To: Liang, Mengning;
Cc: Dubrovin, Mikhail;
Suggested Meetings

Hi Meng,

I talked with Mikhail about the fiber-diffraction "sprint" to get results for Germany that you have strong confidence in. We'll come by your office around 4 today to launch.

We'll also touch base Monday, Tuesday, Wednesday, Thursday next week at 3pm to make sure we're headed in the right direction. Those are allowed to be brief (more important to do real work).

chris

2017-02-24 fiber diffraction: to do

O'Grady, Paul Christopher

Fri 2/24/2017 5:06 PM

To: Liang, Mengning <mliang@slac.stanford.edu>; Dubrovin, Mikhail <dubrovin@slac.stanford.edu>;

meng provides "100 events" (good and bad) in run 169

meng provides her current psocake-peak-params

meng provides problematic l=0,l=1 indexing output, mikhail fixes code

mikhail: move to psocake-consistent parameters to make life easier for meng

mikhail: do fraser_xyz and fraser have same conventions and yield same results?

mikhail: peak-fit needs to output qh and qv for the *peak* (not lattice) for images that don't index for the 100 bad events

mikhail: check after event-selection most things should fit (70-80%) and most should index

mikhail: as a longer-term target modify the pipeline so that meng can look at outputs at various stages more easily

all: tweak peak-finding parameters for the 100 events

all: ask chuck what should we use for background

2017-02-27 Meng's peak-finder parameters

Liang, Mengning

Mon 2/27/2017 3:14 PM

To: Dubrovin, Mikhail;

Cc: O'Grady, Paul Christopher;

Peakfinding parameters :

For arc:

peaks_arc = alg_arc.peak_finder_v1(nda, thr_low=40, thr_high=160, radius=8, dr=0.5)

For equator:

peaks_equ = alg_equ.peak_finder_v4(nda, thr_low=60, thr_high=100, rank=4, r0=4, dr=0.5)

Peak selection:

For arc:

alg_arc = PyAlgos(windows=winds_arc, mask=mask_arc, pbits=0)

alg_arc.set_peak_selection_pars(npix_min=20, npix_max=150, amax_thr=100, atot_thr=2000, son_min=5)

For equator:

alg_equ = PyAlgos(windows=winds_equ, mask=mask_equ, pbits=0)

alg_equ.set_peak_selection_pars(npix_min=5, npix_max=150, amax_thr=100, atot_thr=600, son_min=4)

2017-02-27 cpo - notes to do

O'Grady, Paul Christopher

Mon 2/27/2017 3:46 PM

Adding notes from today:

for peak-finding we will standardize on:

- median filter.
- peakfinderv4

good events should have 2-4 equatorial peaks, 0-2 arc peaks, OR 2 arc peaks and 1-3 eq peaks

80% of the good events should be found, with tuned peak-finding and the above event-selection criteria

switch to mode 5 common-mode (unbonded pixels)

meng file with equatorial peaks incorrectly indexed as l=1:

~mliang/analysis/rel-cxif5315/work1/index3d/test1/peak-idx-cxif5315-r0169-2017-01-23T10:39:03.txt

2017-02-27 Meng - list of good/bad events

Liang, Mengning
Mon 2/27/2017 3:48 PM
To: Dubrovin, Mikhail;
Cc: O'Grady, Paul Christopher;

Here is a list of good events (psocake event numbers)
They will have 2-4 peaks in the equatorial region
or
2 peaks in the arc region + 1-4 peaks in the equatorial region.
Thanks,
Meng

[2017-02-27-cxif5315-r0169-good-events.txt](#)

[2017-02-27-cxif5315-r0169-bad-events.txt](#)

Comparison of analysis script with psocake

In peak-finding script

```
alg_arc = PyAlgos(windows=winds_arc, mask=mask_arc, pbits=2)
alg_arc.set_peak_selection_pars(npix_min=20, npix_max=1000, amax_thr=0, atot_thr=2000, son_min=5)

alg_equ = PyAlgos(windows=winds_equ, mask=mask_equ, pbits=0)
alg_equ.set_peak_selection_pars(npix_min=5, npix_max=1000, amax_thr=0, atot_thr=600, son_min=5)

for i, evt in enumerate(ds.events()) :
    nda_data = det.calib(evt, cmpars=(5,50))

    if nda_data is not None :
        nda = np.array(nda_data, dtype=np.float32, copy=True)

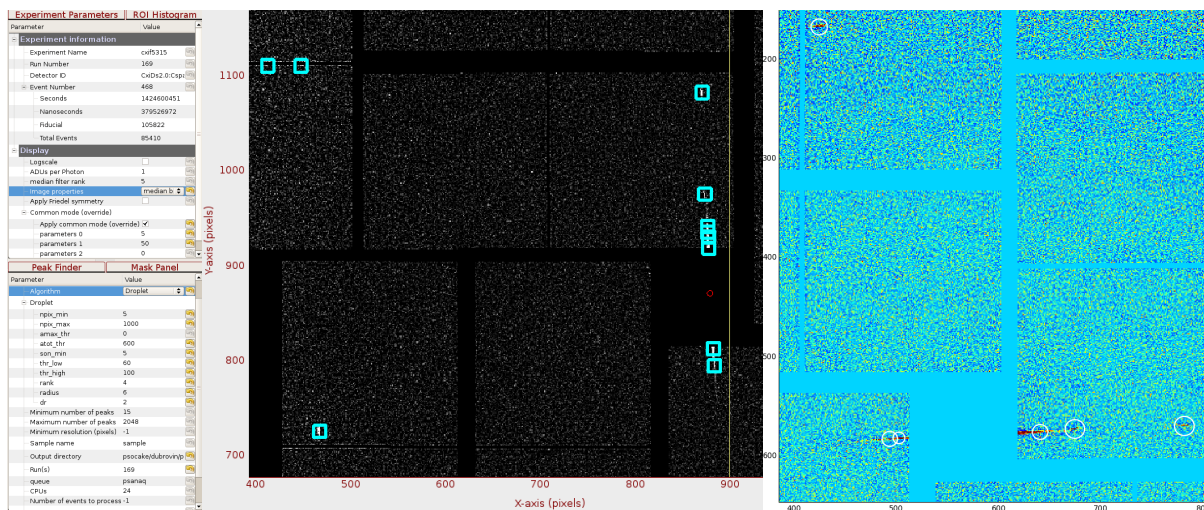
        if BKG_MODE == BKG_MODE_NORMAL :
            nda = subtract_bkgd(nda, nda_bkgd, mask=nda_smask, winds=winds_bkgd, pbits=0)

        peaks_arc = alg_arc.peak_finder_v4r2(nda, thr_low=40, thr_high=160, rank=8, r0=10, dr=2)
        peaks_equ = alg_equ.peak_finder_v4r2(nda, thr_low=60, thr_high=100, rank=4, r0=6, dr=2)
```

Running scripts

```
sit_setup ~yoon82/ana2 # some problem fixed in this local release
psocake -e cxif5315 -r 169 -d CxiDs2.0:Cspad.0 -n 468 -o psocake

python cxif5315/proc-cxif5315-r0169-data-pfvn-2017-02-27.py
```



Conclusion: within mask-permitted region analysis script finds the same peaks as psocake

Base-ring pixels

Base-ring-pixel map r0=10 and 6 dr=2

r0=6 dr=2

```
0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0
0 0 0 0 0 1 1 1 1 1 1 1 0 0 0 0 0 0
0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0
0 0 1 1 1 0 0 0 0 0 0 0 0 1 1 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 1 1 0 0
0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0
0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0
0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0
1 1 1 0 0 0 0 0 0 + 0 0 0 0 0 1 1 1
0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0
0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0
0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 1 1 0 0
0 0 1 1 1 0 0 0 0 0 0 0 0 0 1 1 0 0
0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0
0 0 0 0 0 1 1 1 1 1 1 1 1 0 0 0 0 0
0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0
```

Number of pixels to estimate background = 88

r0=10 dr=2

```
0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0
0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 0 0 0 0
0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 0 0 0
0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0 0
0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0
0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0
0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0
0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0
1 1 1 0 0 0 0 0 0 0 0 0 0 + 0 0 0 0 0 0 0 0 0 1 1 1
0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0
0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0
0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0
0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0
0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0
0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 0
0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 0
0 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 0
0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
```

Number of pixels to estimate background = 136

Event list

List of events from Meng

Liang, Mengning
Tue 2/28/2017 4:09 PM
To: Dubrovin, Mikhail;

148 - double hit in equator - 3 peaks
162 - no peaks
525 - double hit in equator - 6 peaks
1456 - should find multiple arc peaks
1521 - double hit equator - 4 total peaks
2551 - no peaks
I could not find parameters to find the right peaks in these events - can see by eye where the peaks are.
Thanks,
Meng

[2017-03-01 Images for 6 events selected by Meng](#)

2017-03-02 Peak selection parameters

2017-03-03 Peak selection parameters

Example of commands for updated scripts

News

- peak-finding script is updated for v4r2, parameters tuned, script is available as `cxif5315/proc-cxif5315-r0169-data-pfvn-2017-02-27.py`
- filter is separated from peak processing peaks as `cxif5315/filter-peaks-2017-03-07.py`
- almost done with `cxif5315/fit-peaks-2017-03-08.py -p`

Session initialization

```
cd ~/LCLS/rel-mengning  
sit_setup
```

Run peak-finder (by default for cxif5315 run 169)

```
cxif5315/proc-cxif5315-r0169-data-pfvn-2017-02-27.py -h          # help  
cxif5315/proc-cxif5315-r0169-data-pfvn-2017-02-27.py -n 20 -m 10 -i # plot images  
cxif5315/proc-cxif5315-r0169-data-pfvn-2017-02-27.py          # run over all events and find peaks
```

Run filter for all/good100/bad100/6events events

With peak-finder have generated files with peaks. Now filter them.

```
cxif5315/filter-peaks-2017-03-07.py -h  
cxif5315/filter-peaks-2017-03-07.py -i work/xpfv4r2-cxif5315-r0169-2017-03-03-e085409.txt -p # -p - plot  
histograms  
cxif5315/filter-peaks-2017-03-07.py -i work/xpfv4r2-cxif5315-r0169-2017-03-03-bad100.txt  
cxif5315/filter-peaks-2017-03-07.py -i work/xpfv4r2-cxif5315-r0169-2017-03-03-good100.txt  
cxif5315/filter-peaks-2017-03-07.py -i work/xpfv4r2-cxif5315-r0169-2017-03-03-esix.txt
```

See list of selected peaks and filter logbook

```
less ./results/peaks.txt
less ./results/peaks-filtered-log.txt
```

Plot event

```
cxif5315/proc-cxif5315-r0169-data-pfvn-2017-02-27.py -m 525 -n 1 -i
```

Meng's events (148, 162, 525, 1456, 1521, 2551)

```
148 - double hit in equator - 3 peaks
162 - no peaks
525 - double hit in equator - 6 peaks
1456 - should find multiple arc peaks
1521 - double hit equator - 4 total peaks
2551 - no peaks
```

Filtering results

- run 169 sample - selected 9735 of 83727 (saved after peak-finder pf4r2)
- 6-event sample - selected 0
- 100-good-event-sample - selected 82
- 100-bad-event-sample - selected 19

2017-03-10 Peak Filtering

2017-03-13 Fit for phi and beta

2017-03-16 Comparison with images from Kartik

2017-03-17 mtg w Meng

To do

- ask Kurtik about smoothing and other event processing stages
- median background ?
- class0 background - no equ peaks, no arc peaks, water ring yrs
- radial background
- fudge factor on existing subtraction
- learn more about pattern_sim from Chuck

2017-03-21 Background subtraction

2017-03-28 Results of pattern_sim

2017-04-13 Processing of pattern_sim events

2017-04-25 Indexing

2017-05-03 Test simulation and processing chain for different beta and omega

References