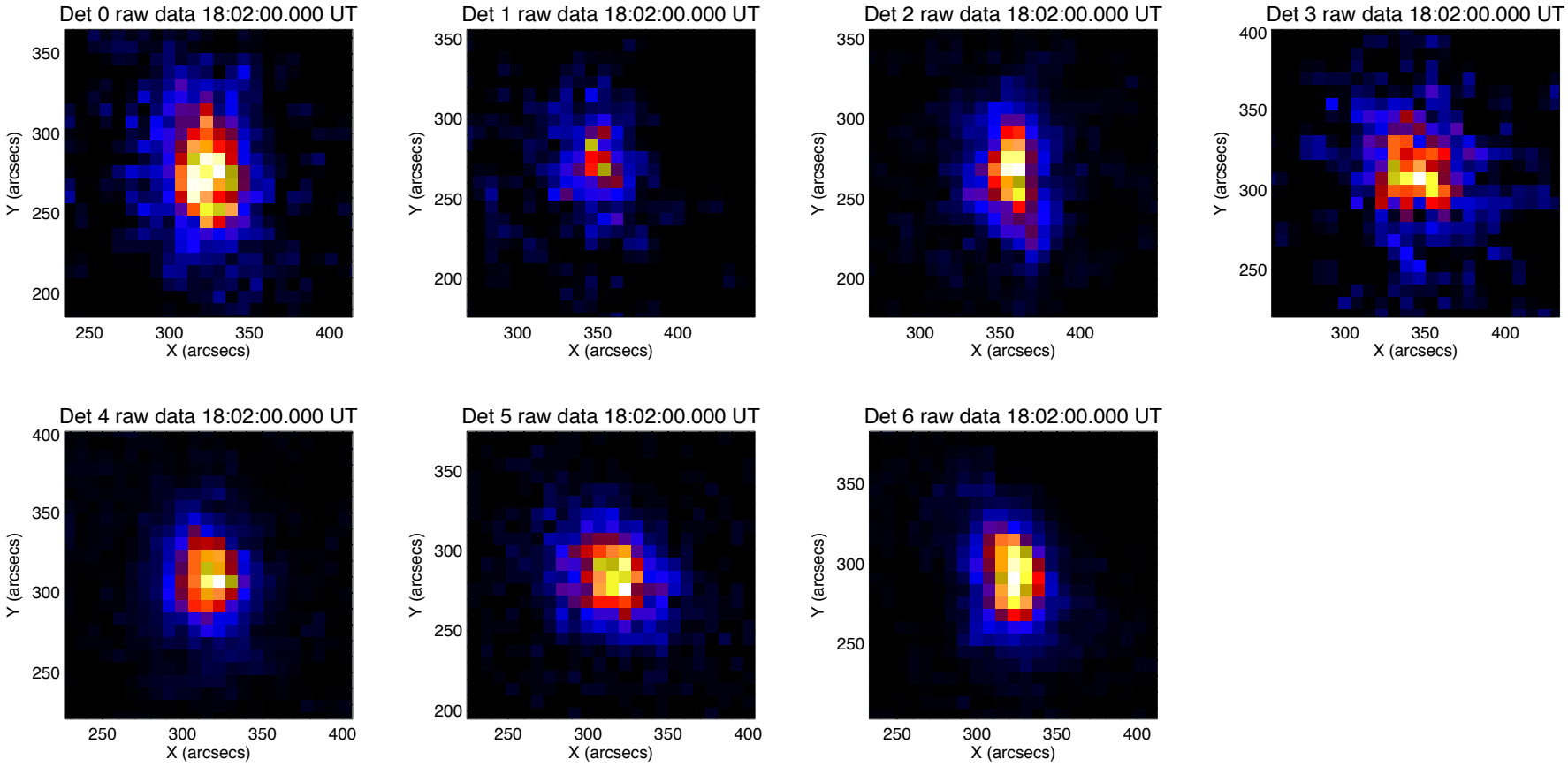
Update on FOXSI-1 image deconvolution

2014 Jan 21

Changes

- Found bug in image binning!
  - Redid analysis converting raw data directly into plot_maps and using only rot_map, etc.
- Smooth PSF (see later)
- Tried changing platescale (see later)

Raw images, no deconvolution



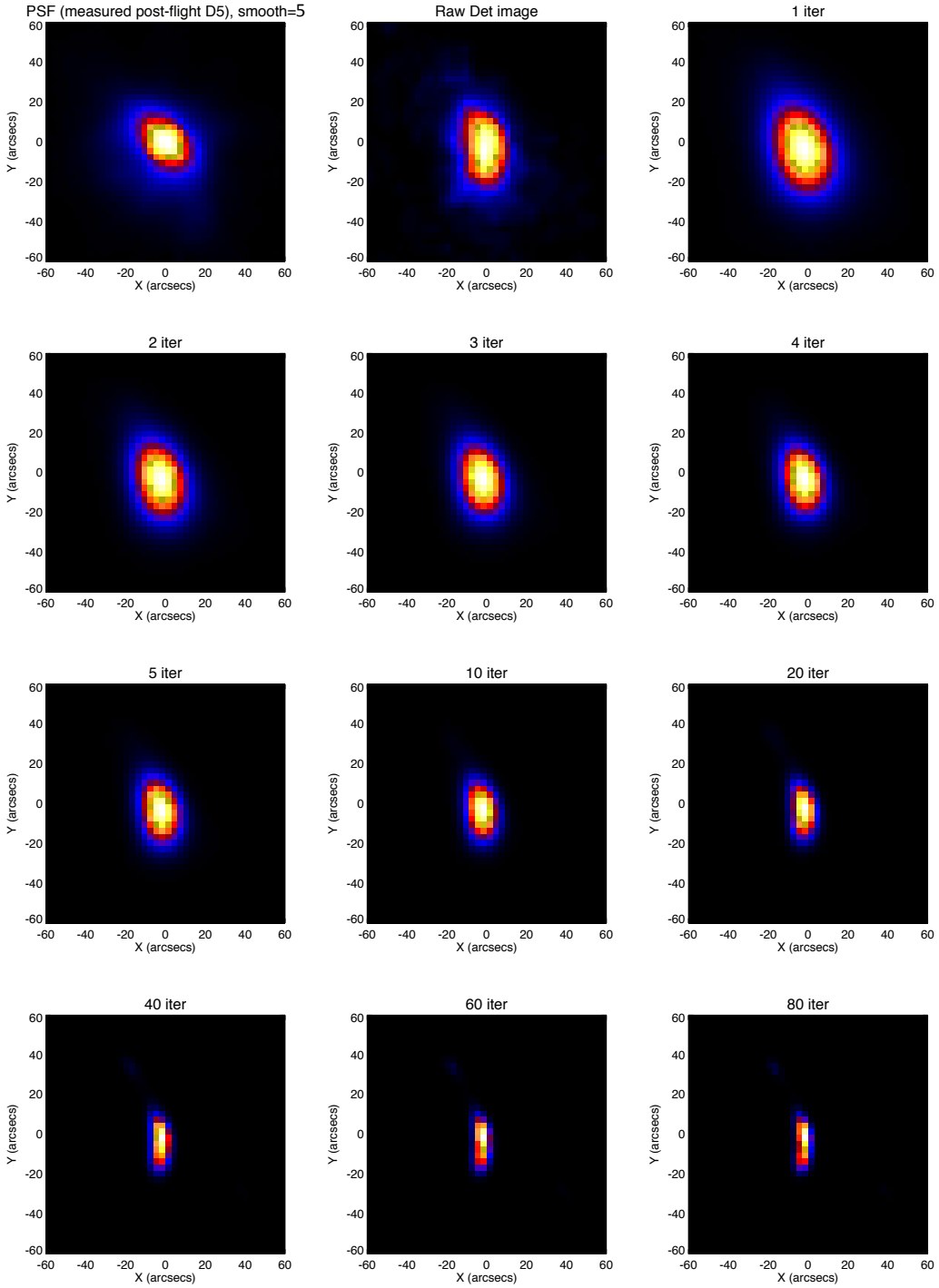
Images have been rotated (using rot_map) according to their geometrical placement.
X-Y scale is arbitrary in these plots.

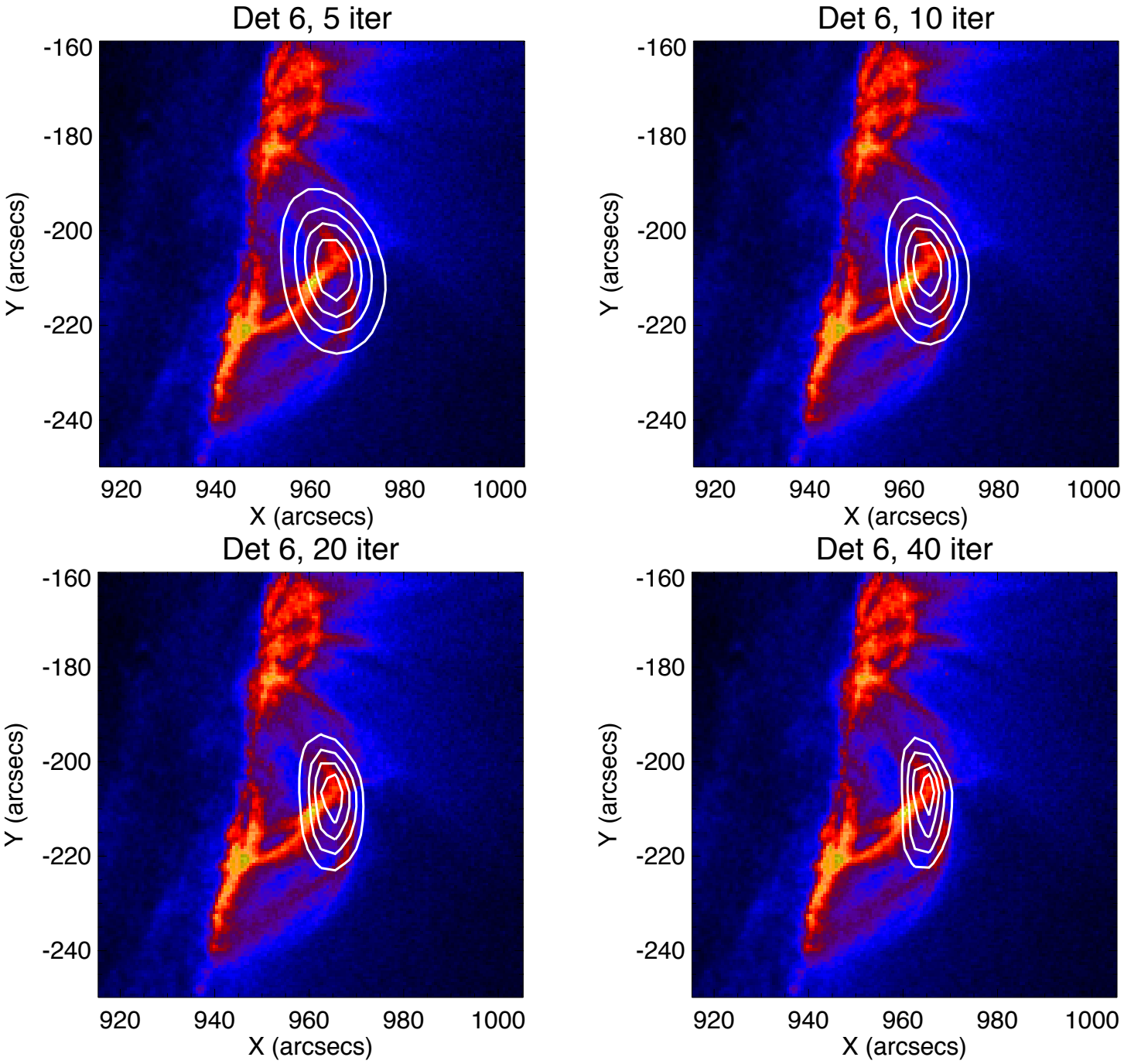
Image deconvolution

- Same as before, using IDL procedure

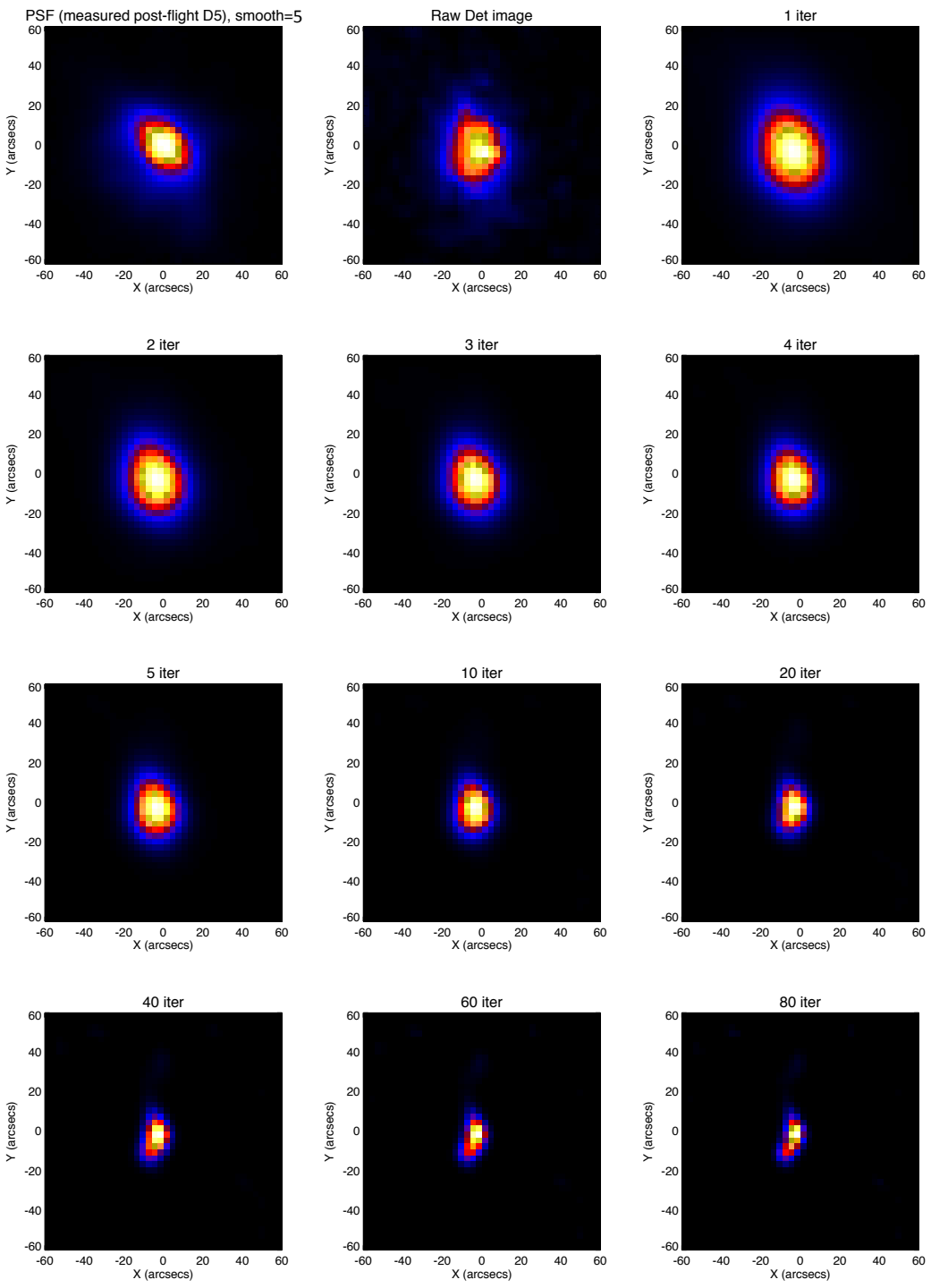
  max_likelihood, raw_img, psf, deconv_img

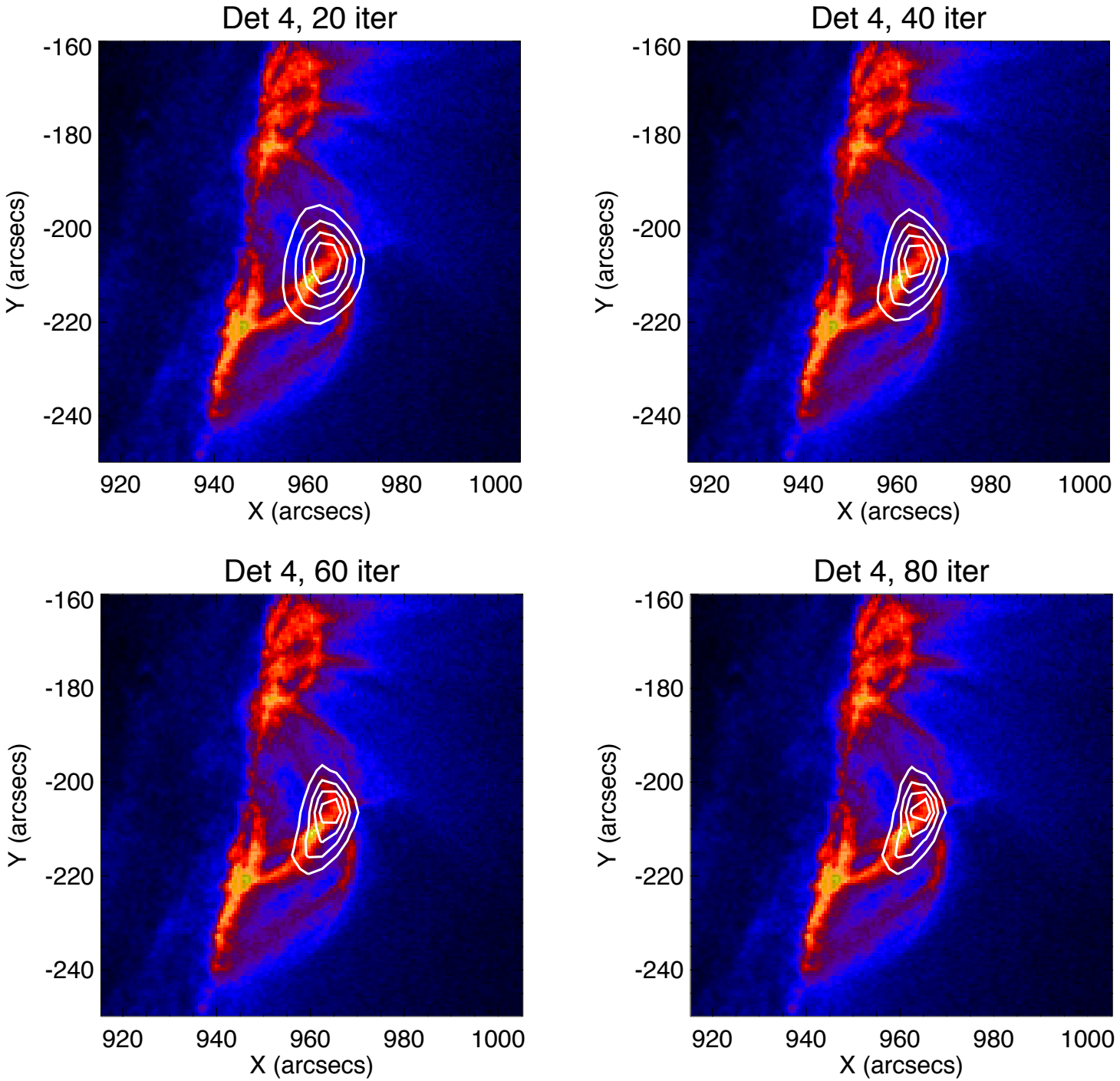
Det 6


PSF (measured post-flight D5), smooth=5
Raw Det image
1 iter
2 iter
3 iter
4 iter
5 iter
10 iter
20 iter
40 iter
60 iter
80 iter
Y (arcsecs)
X (arcsecs)
60
40
20
0
-20
-40
-60

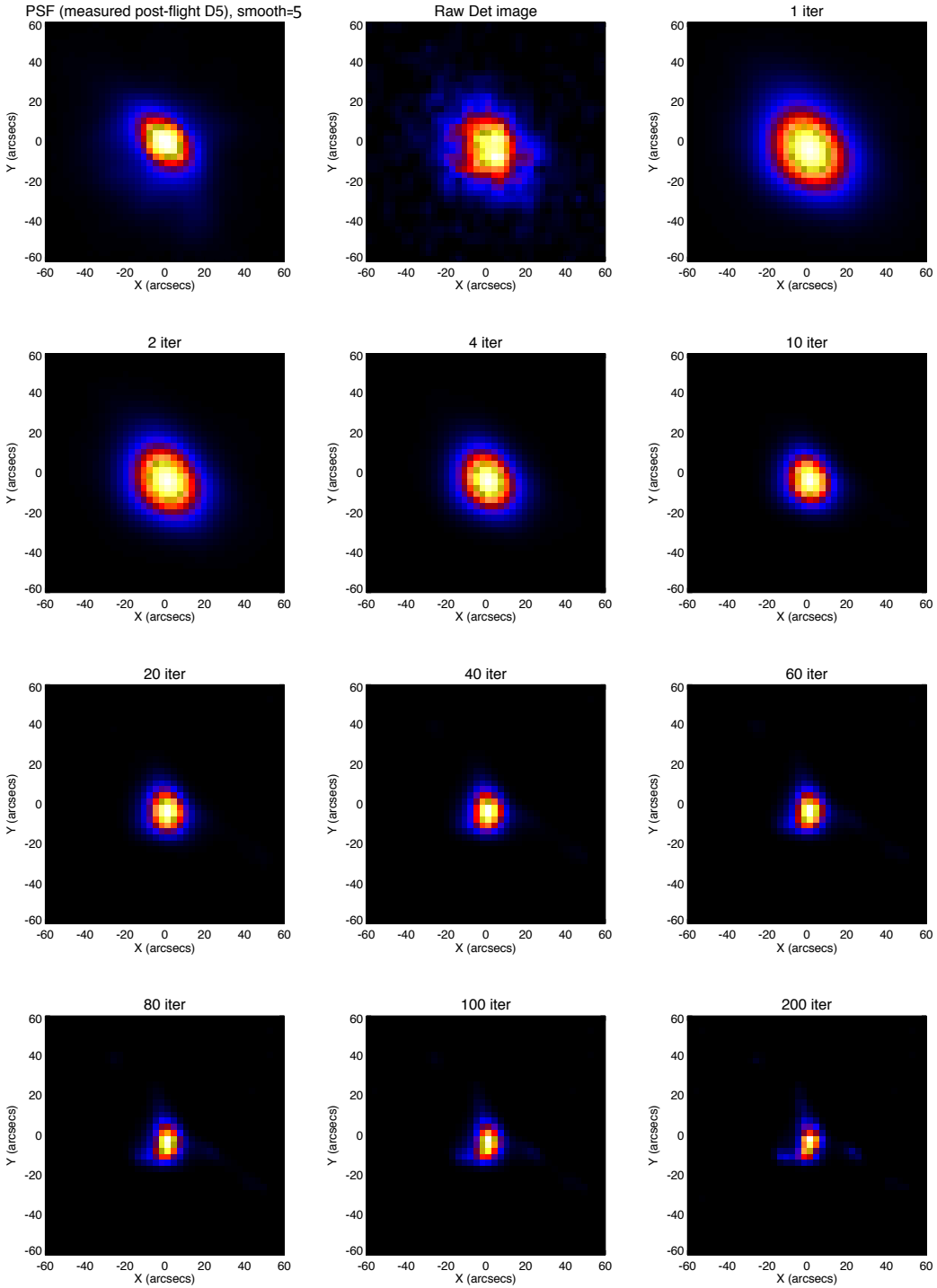

Det 6, 5 iter
Det 6, 10 iter
Det 6, 20 iter
Det 6, 40 iter
-160
-180
-200
-220
-240
Y (arcsecs)
920
940
960
980
1000
X (arcsecs)

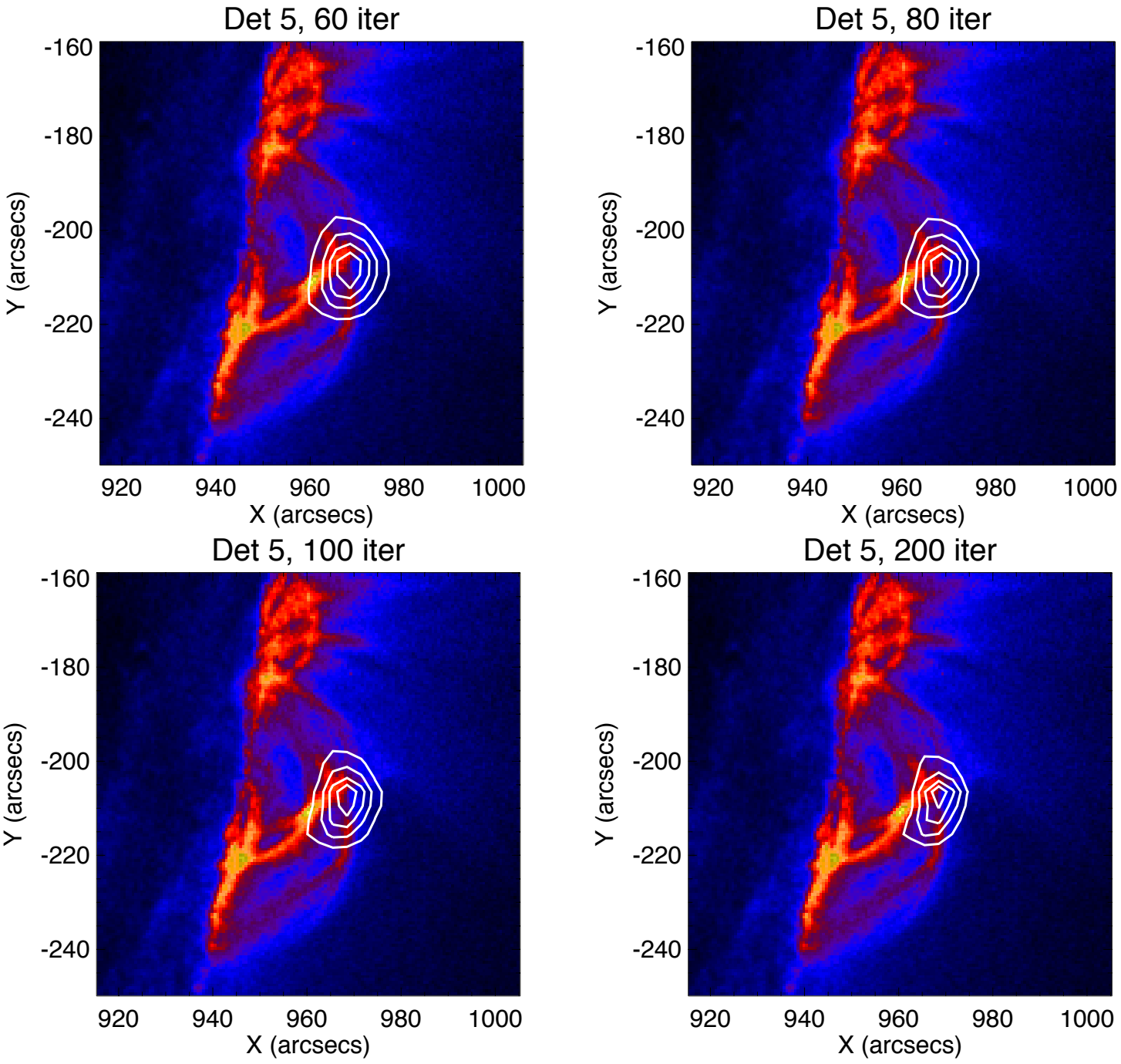
Det 4


PSF (measured post-flight D5), smooth=5
Raw Det image
1 iter
2 iter
3 iter
4 iter
5 iter
10 iter
20 iter
40 iter
60 iter
80 iter
Y (arcsecs)
X (arcsecs)
60
40
20
0
-20
-40
-60


Det 4, 20 iter
Det 4, 40 iter
Det 4, 60 iter
Det 4, 80 iter
Y (arcsecs)
X (arcsecs)
-160
-180
-200
-220
-240
920
940
960
980
1000

Det 5

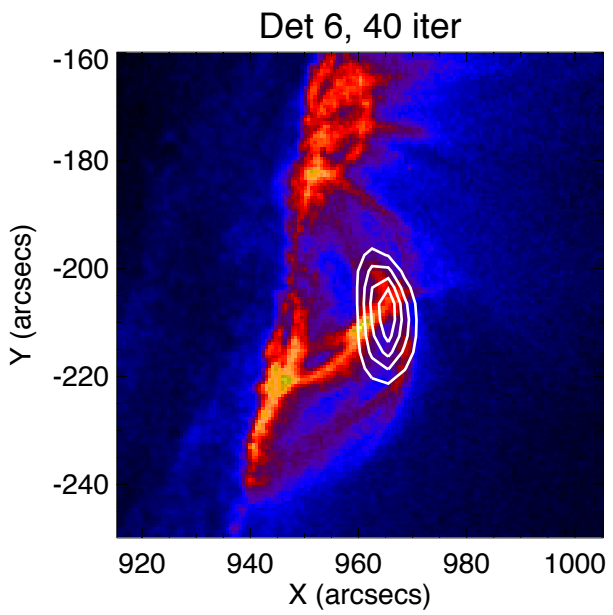

PSF (measured post-flight D5), smooth=5
Raw Det image
1 iter
2 iter
4 iter
10 iter
20 iter
40 iter
60 iter
80 iter
100 iter
200 iter
Y (arcsecs)
X (arcsecs)
60
40
20
0
-20
-40
-60

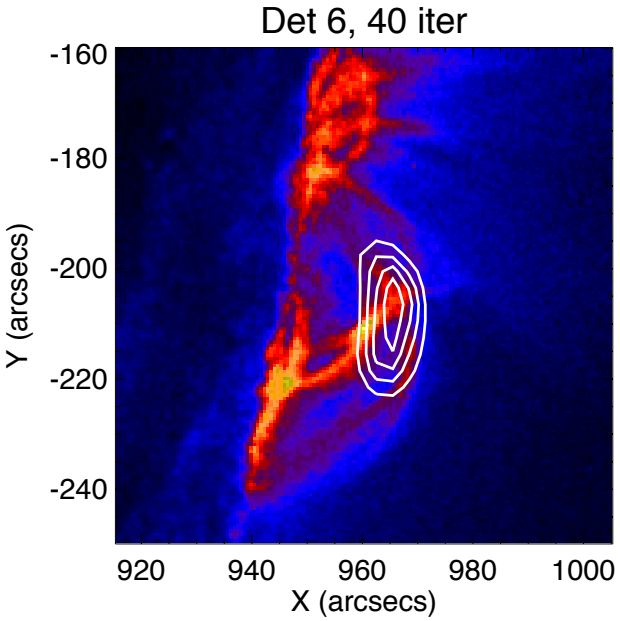

Det 5, 60 iter
Det 5, 80 iter
Det 5, 100 iter
Det 5, 200 iter
-160
-180
-200
-220
-240
Y (arcsecs)
920
940
960
980
1000
X (arcsecs)

Detector 6 does better with less smoothing and with a *smaller* PSF?

Smooth = 5

PSF plate scale = 1.3" ("correct" value)



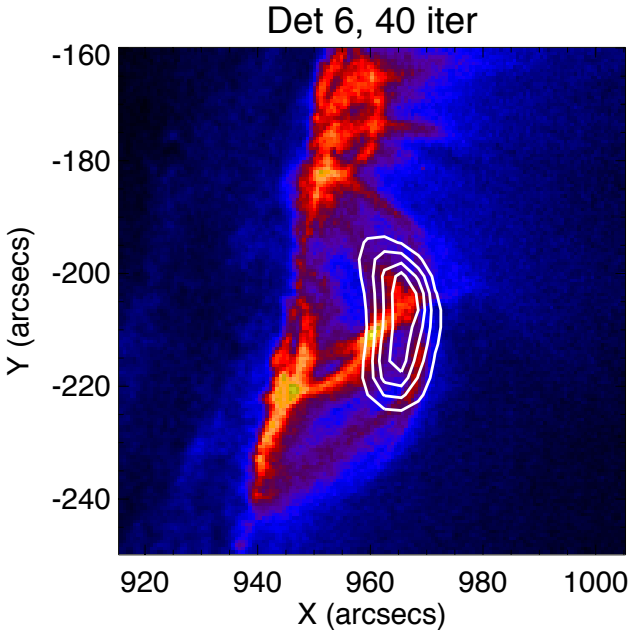


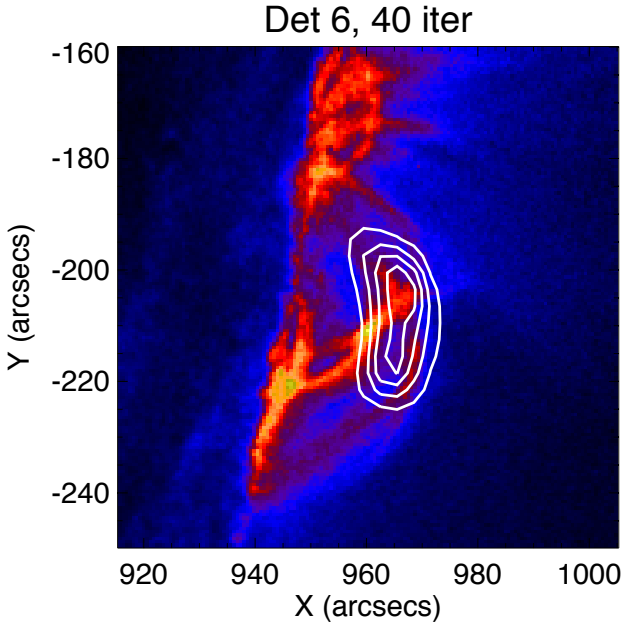
Smooth = 2

PSF plate scale = 1.3"

Smooth = 2

PSF plate scale = 1.0"





Smooth = 2

PSF plate scale = 0.8"