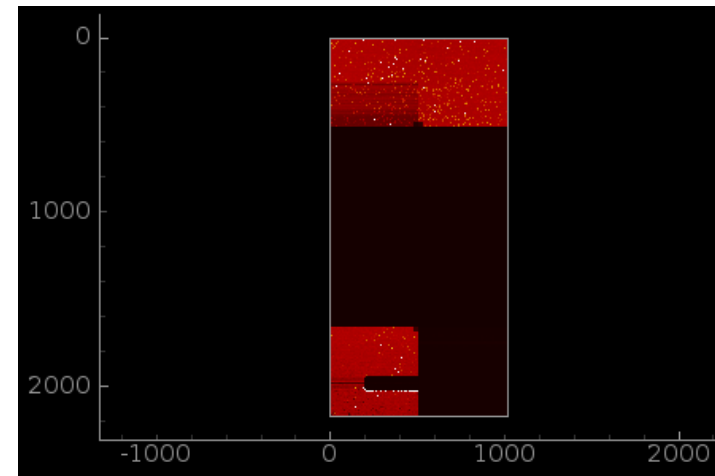
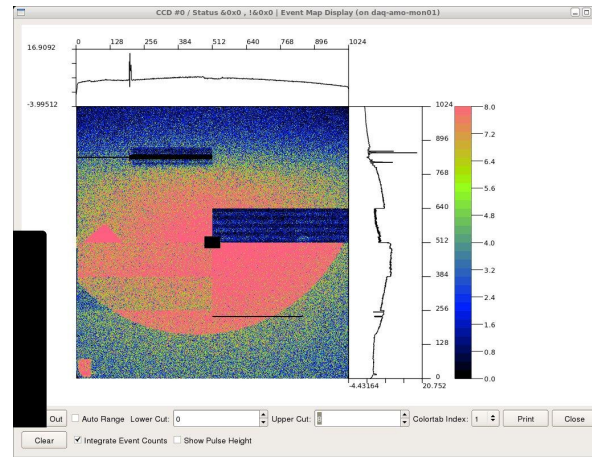
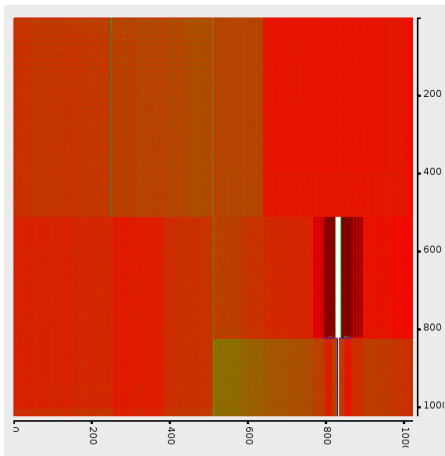


pnCCD Orientation Notes

- This is data from amo86615
- Front detector has “bad half” in the -y direction (according to Hart/Mitra). This is from table 3 from this document, where it says that the two lowest numbered quads are the “top”. They have observed that the cable labeled T-21 is physically near the top of the chamber for the front-detector. Mikhail Dubrovin has found quads 2,3 (counting from zero) are the “bad half”, hence near the bottom:
 - [Lamp User Manual \(confluence\)](#)
- The front-detector bad-half is “closer one” to IP in y (according to Aquila): it was moved in y until it started creating a shadow on the back detector
- Back detector has the corresponding half in the -x direction (i.e. 90 degree rotation; see slide 4)
- The two pnCCD halves are separated in z by ~3mm (not clear which half is “more forward”)
- Detectors well-aligned in x
- Back detector is well-centered on beam

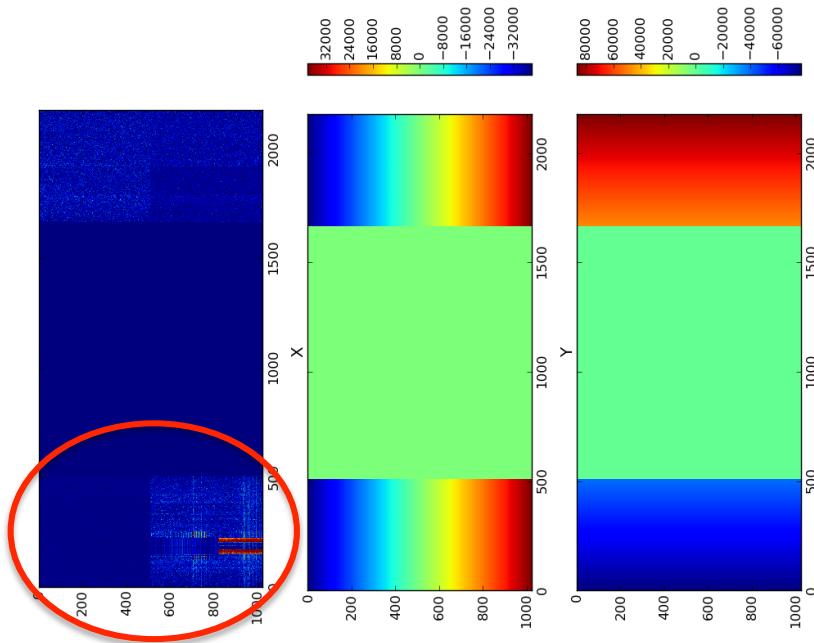
Sign of 90° Rotation

- Given the 90-degree rotation between front/back detectors, what is the correct sign for the rotation in the psana geometry file?
- Matt Weaver says AMI (left) shows detector as viewed from the front, while Xonline (middle) shows detector from the back (which astronomers prefer). Psana (right, with big geometry gap) looks like ami (i.e. **front view!**) but rotated 90.
- Sven Herrmann also says that the Xonline view is from the back (like they do in astronomy)
- Psana/matplotlib view from front has x increasing downward and y is toward right (“matrix” display) but in the official reference frame (see slide 1) x increases to the left when viewed from front. This means psana needs a 180 rotation around y to get x to match the official frame. i.e. the “back view” is more natural for the official reference frame. We should then rotate back detector -90 around z to get the “corresponding half” to point in the -x direction (see notes on slide 2). Both detectors should get the 180 y-rotation if we want the coordinate system in slide 1.



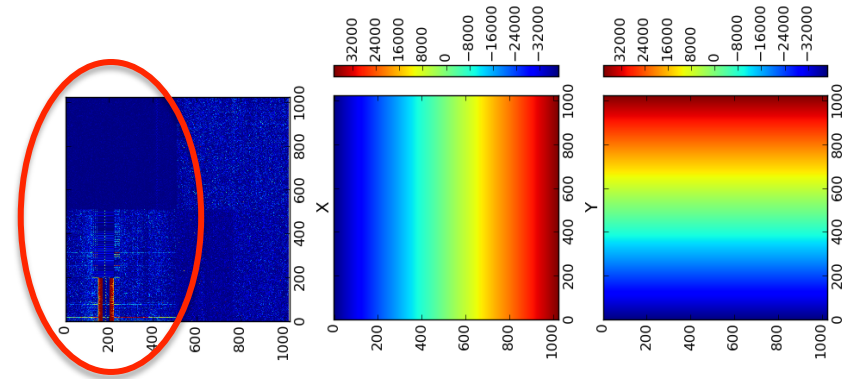
Psana Images With Deployed Geometry

Front Detector



Bad quads in $-y$,
viewed from
back of detector

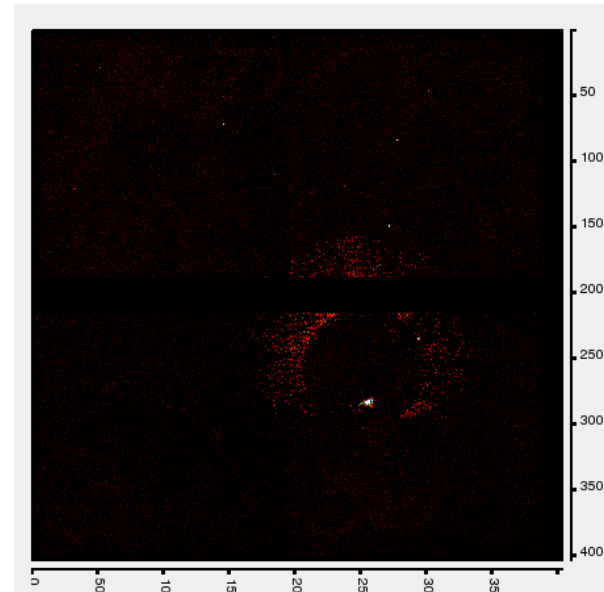
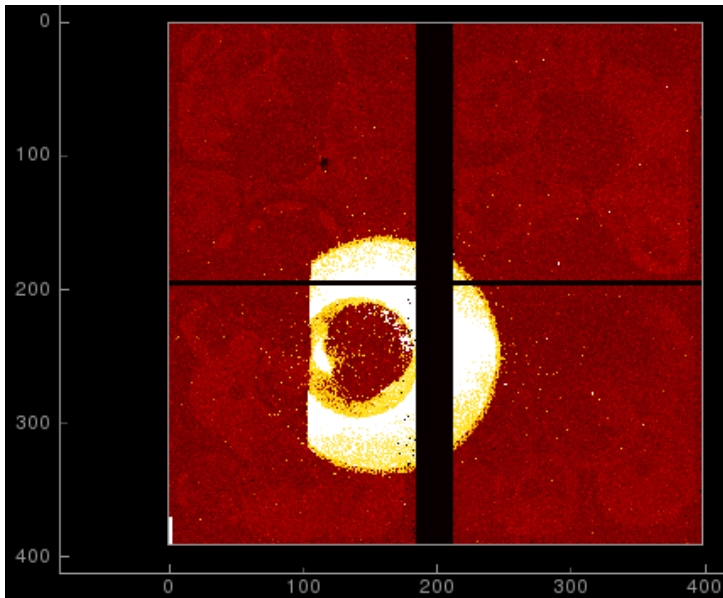
Back Detector (but using same
front detector data for clarity!)



Corresponding
quads in $-x$,
viewed from
back of detector

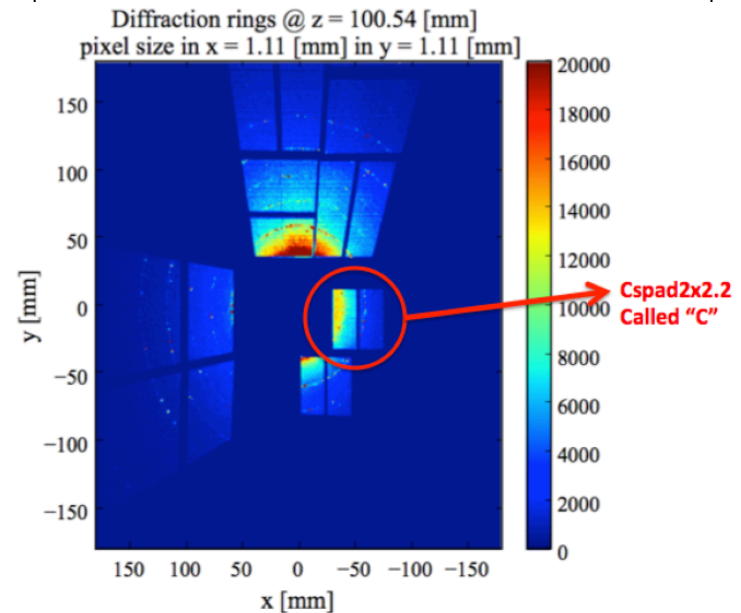
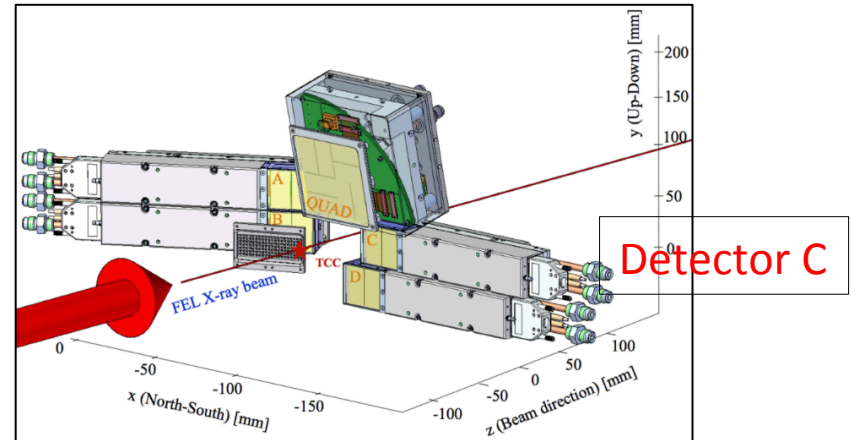
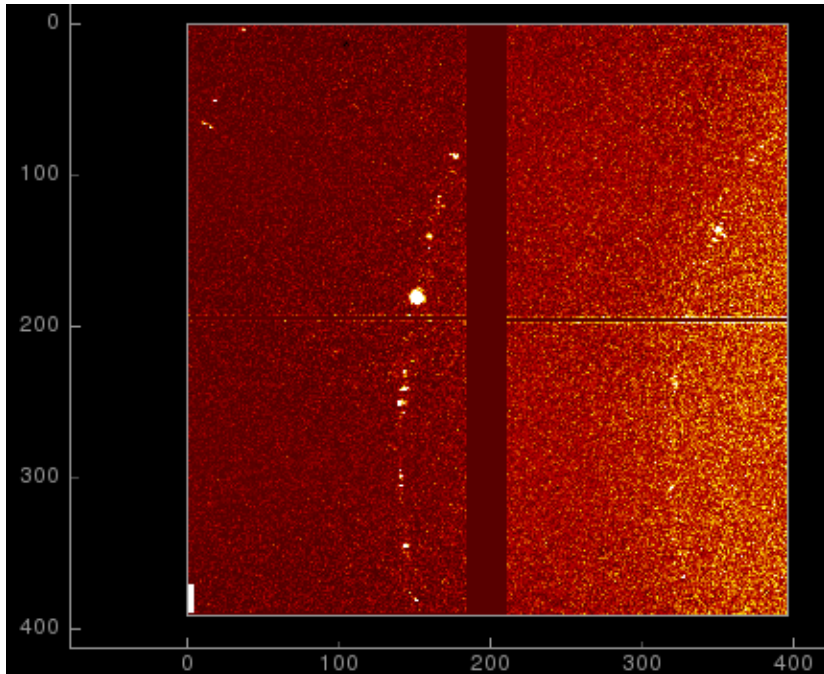
cspad2x2 Orientation Notes

- Matt says AMI shows the detector as viewed from the “front” for both cspad and cspad2x2 (he ignores x/y rotations in the psana geom file).
- This is cxi02316 run 33 “max value” in psana (left) and a single event in AMI (right). There is only a 90-degree rotation, so psana also views it from the front, by default. 2x1 number “zero” has it’s first 20 fast-scan pixels highlighted in white and 3 slow-scan pixels(lower-left corner of psana plot). These are read out interleaved with 2x1 number “one”.
- Note that there are no rotations about x/y in the psana-geom file. Matt says AMI ignores x/y rotations. Z had 180 rotation for both 2x1’s.



From Zhou Xing

Det "C" from psana, viewed from front, with 2x1 number "zero" with 20 fast-index and 5 slow-index pixels highlighted (lower left). Combined with pictures on right, suggests cooling tubes come out left



From Sven Hermann, showing "default" AMI orientation

