CSPAD alignment using images of rings

TJ Lane & JA Sellberg have developed an algorithm for CSPAD quads alignment using images with rings. Resulting ASIC positions in 3D space are saved in the file with their own format. This file can be converted to the psana-style calibration types **center_global** and **tilt**. The conversion procedure is presented in this note.

Input data

File from TJ Lane & JA Sellberg: 2013-07-30-TJ-DS1-r0013.txt
See note: T.J. Lane, Detector Metrology Tolerance in cxi64813

Conversion procedure

Converter convertTJPars.py can be run using command:

```
% python ./getTJParameters.py 2013-07-30-TJ-DS1-r0013.txt
```

which currently produces two files for psana-style calibration types **center_global** and **tilt**, which are explained in CSPAD Geometry and Alignment:
`TJ-center_global-0-end.data`:

```
   484.00    696.28    167.27    167.32    282.62     70.00    597.51    597.42
  1002.69   1002.33   1120.10    907.36   1433.16   1434.15   1517.05   1304.47
  1186.43    974.88   1501.88   1502.64   1390.80   1603.10   1075.83   1076.38
   675.15    674.94    565.15    777.82    247.93    249.66    160.76    373.35

  1021.57   1021.56   1134.96    922.45   1451.31   1452.31   1536.95   1323.82
  1206.55    994.22   1520.06   1521.09   1406.76   1619.01   1092.68   1093.05
   691.28    691.45    579.15    792.26    264.56    264.19    177.36    390.17
   505.20    717.65    186.78    187.91    301.57     90.00    615.89    616.29

     0.08      0.19     -0.15     -0.25      0.26      0.01      0.35      0.35
     0.23     -0.14      0.47      0.70     -0.41     -0.15     -1.22     -0.60
    -0.07      0.15     -0.09     -0.17      0.12      0.18      0.04     -0.12
     0.10     -0.07      0.49      0.24      0.24      0.49      0.36      0.27
```

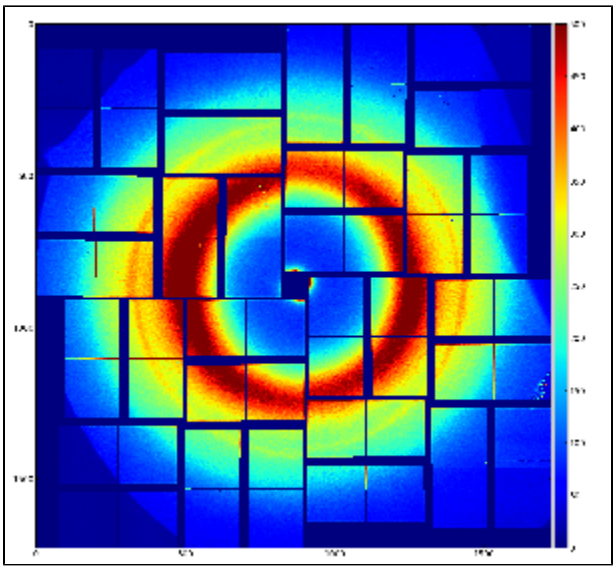
and `TJ-tilt-0-end.data`:

```
 -0.10946  -0.04691  -0.32318   0.03127   0.26585   0.15639   0.08340  -0.26584
  0.12509   0.06776   0.11469   0.11469   0.42221   0.14075   0.09904   0.04692
  0.26585  -0.08862  -0.29189  -0.07297  -0.02606  -0.06776   0.18244  -0.05733
 -0.23976  -0.13030  -0.54735  -0.47433  -0.40136  -0.44305  -0.10946  -0.19807
```

Test of image

Use PyCSPadImage/src/Examples.py for image reconstraction with parameters:

```
        fname      = '/reg/d/psdm/CXI/cxia4113/hdf5/cxia4113-r0013.h5'
        path_calib = '/reg/neh/home1/dubrovin/LCLS/CSPadAlignment-v01/calib-test-cxia4113-r0013-Ds1/CsPad::
CalibV1/CxiDs1.0:Cspad.0/'
        do_peds    = True
        event      = 600
        nevents    = 100
        amps       = (0, 500)
```



References

T.J. Lane, Detector Metrology Tolerance in cxi64813