

XTCAV in psana

Content

Test data files

Files used in Tim's scripts

See: `~tmaxwell/xtcavStuff/exampleAnalysis/doubleSlotExampleScript.m`

```
bgrFilename = 'xppm0114-r0032.h5'; % Background / dark images.  
bslFilename = 'xppm0114-r0034.h5'; % Baseline / lasing-off images.  
sigFilename = 'xppm0114-r0036.h5'; % Signal / lasing-on images.
```

Files suggested by Chris

`/reg/d/psdm/amo/amoc8114/xtc/e435-r0196-s80-c00.xtc`

```
EventKey(type=Psana::Camera::FrameV1, src=DetInfo(XrayTransportDiagnostic.0:Opal1000.0),  
alias="xtcav")
```

Chris's indexing-based access to xtcav data: [xtcav.py](#)

Available data sources

data of different types appear with delay after beginning of the file.

Skip 200 events then 5 next have both sources in the Event keys:

```
Event keys:  
  EventKey(type=Psana::Camera::FrameV1, src=DetInfo(XrayTransportDiagnostic.0:Opal1000.0))  
  EventKey(type=PSEvt::EventId)  
  EventKey(type=Pds::Dgram)  
  EventKey(type=PSEvt::DamageMap)  
Event keys:  
  EventKey(type=Psana::EvrData::DataV3, src=DetInfo(NoDetector.0:Evr.0), alias="evr0")  
  EventKey(type=Psana::Camera::FrameV1, src=DetInfo(XppEndstation.0:OrcaFl40.0), alias="orca")  
  EventKey(type=Psana::Bld::BldDataEBeamV5, src=BldInfo(EBeam))  
  EventKey(type=Psana::Bld::BldDataFEEGasDetEnergy, src=BldInfo(FEEGasDetEnergy))  
  EventKey(type=Psana::Ipimb::DataV2, src=BldInfo(NH2-SB1-IPM-01))  
...
```

Detector

Variable size cameras (cropped at DAQ?):

- `XppEndstation.0:OrcaFl40.0`, `shape=[304,2045]`
- `XrayTransportDiagnostic.0:Opal1000.0`, `shape=[520,478]`

Calibman

✓ Save calibration files as text with metadata for Tm6740, Opal#000, OrcaFl40, using `ImgAlgos/NDArrAverage`.

To-do and problems

➕ `NDArrIOV1` should return ndarray from file without complain about its size

+ Add OrcaFI40 and Opal in GenericCalibPars

? Background - can be add in the list of calib types and accounted by the NDArrCalib, but xtcav needs in background groups by similarity in shape.

In xtcav analysis background profile need to be averaged in groups (Tim uses 5 groups):

- get image
- subtract pedestal
- get profile
- average profile in groups, distinguished by R2

Reference

- [Doxydoc for pdscalibdata/NDArrIOV1](#)
- [Doxygen for PSCalib/GenericCalibPars](#)
- [lcls2/psana/psana/pscalib/calib/XtcavUtils.py](#)