

LCLS-II Calibration DB

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This note describes calibration constants Data Base for LCLS-II.

Intro

In LCLS-II calibration constants resides in the data bases. Access to the DB can be done through python API, CLI, and GUI. At regular deployment calibration constants goes in two databases designated for experiment and for detector. In regular request for calibration constants experimental DB is addressed first, then if constants not found, the detector DB is included in search. These features are sufficient for regular operations with detectors.

Calibration DB names

Calibration constants on MongoDB server are grouped in databases identified by their names

- `cdb_<experiment-name>`
- `cdb_<detector-name>`

for example

- `cdb_rixx45619`
- `cdb_epixhr2x2_000001`

Add constants to the DB

Constants can be deployed with commands [cdb](#) and [epix10ka_deploy_constants](#), see for detail in [psana environment](#):

- `cdb -h`
- `epix10ka_deploy_constants -h`

for example

- `cdb add -e rixx45619 -d epixhr2x2_000001 -t 2021-10-01T00:00:00-0800 -c pedestals -f mypeds`
- `cdb add -e rixx45619 -d epixhr2x2_000001 -t 2021-10-01T00:00:00-0800 -c geometry -f mygeo -i txt`
- `epix10ka_deploy_constants -e rixx45619 -d epixhr -r121 -D`

DB management tool

Browsing and management of constants in calibration DB can be done with command

- [calibman](#)

launching multipurpose GUI application.

Get corrected data

Example of script to get raw and corrected data in [psana environment](#):

```
from psana import DataSource
ds = DataSource(exp='rixx45619', run=121)
det = run.Detector('epixhr')
raw = det.raw.raw(evt)
arr = det.raw.calib(evt)
img = det.raw.image(evt)
```

Direct access to calibration constants

For details see [Area Detector Interface - Calibration Constants](#)

All detector calibration constants (np.array) and associated metadata (dict) are available through the dictionary `det.calibconst` with calibration type as a key. For example,

```
peds, meta = det.calibconst['pedestals']
```

Possible calibration types: `pedestals`, `pixel_status`, `pixel_rms`, `pixel_gain`, `pixel_mask`, etc.

References

- [Area Detector Interface](#)
- [Private Calibration Constants](#)
- [psdm_mongo_ws](#)
- [API access to the LCLS2 eLog](#)
- [ex10-web-iface-murali.py](#)
- [Python Classes for Configuration Management in MongoDB](#)
- [cdb](#) - CLI for management of calibration DB
- [epix10ka_deploy_constants](#) - deployment of calibration constants for epix10ka type of detector.