cold Documentation

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USER GUIDE

Warning: Still under development. It can work but expect some hiccups.

COLD is a software package for processing Laue diffraction images collected with coded-apertures.

CHAPTER

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CREDITS

Coming soon.

CHAPTER

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2.1 Getting started

2.1.1 Before you begin

Coming soon.

2.1.2 Installation

Coming soon.

2.1.3 Setting up runtime environment

Coming soon.

2.1.4 A “Hello world!” example

Coming soon.

2.2 General remarks

2.2.1 Data processing workflow structure

Coming soon.

2.2.2 Packing and unpacking

Coming soon.

2.2.3 Additional resources

Coming soon.

2.3 Runtime cofiguration options

2.3.1 Data readout options

```
file:
    path: myfolder'
    range: [0, 100]
    threshold: 10
    frame: [0, 2048, 0, 2048]
    ext: 'h5'
    chunks: 8
    type: 'stacked'
    h5:
        key: '/entry1/data/data'
```

2.3.2 Geometry options

Aperture

```
geo:
    mask:
        material: 'Au'
        path: 'codes/code-debruijn-2-8-000.npy'
        pad: 300
        bitsizes: [15, 7.5] # [mu]
        resolution: 0.5
        thickness: 7.5 # [mu]
        smoothness: 0 # [mu]
        widening: 2.5 # [mu]
        dist: 1.16 # [mu]
        tiltx: 5 #
        cenx: 290 #
        tilty: 18 #
        ceny: 100 #
        step: 1 # [mu]
        calibrate:
            dist: [1.15, 1.25, 0.01] # [mm]
            tiltx: [0, 8, 1]  # -6
            cenx: [0, 0, 20] # -180
            tilty: [0, 23, 1] # 23
            ceny: [-100, 100, 20]
```

Detector

```
geo:
    detector:
        shape: [2048, 2048] # [pixels]
        size: [409.6, 409.6] # [mm]
        rot: [-1.20139958, -1.21416739, -1.21878591] # [radian]
        pos: [28.871, 2.786, 513.140] # [mm]
```

Source

```
geo:
    source:
        grid: [-1.365, -1.156, 0.001] # [mm]
```

2.3.3 Algorithm options

Decoding

```
algo:
    pos:
        method: 'lsqr'
        init: 0
    sig:
        method: 'nnls'
        init:
            maxsize: 120 # [mu]
            avgsize: 20 # [mu]
            atol: 4
```

Peak searching

Indexing

2.4 Aperture focusing

Coming soon.

2.5 Peak searching

Coming soon.

2.6 Indexing

Coming soon.

2.7 General remarks

2.7.1 Licensing

We use the BSD-3 licence that grants anyone almost unlimited freedom to do with the software as they please.

2.7.2 Coding style

Readability counts! Try to follow PEP 8 style guide as much as possible, and more importantly use common sense and be consistent.

2.8 File formats

2.8.1 APS 34-ID-E data format

The data is stored as HDF5 file format. Some of the important keys are given below:

```
key:
    '/entry1/data/data'
```

2.9 Data structures

2.9.1 Measurement data

```
import cold
path = 'myfolder/'
data = cold.read(path)
print (data.dtype, data.shape)
```

2.9.2 Coded-apertures

```
import cold
path = 'myfolder/mymask.npy'
mask = cold.mask(path)
print (mask.dtype, mask.shape)
```

2.10 Adding new models

Coming soon.

2.11 Parallel execution

Coming soon.

2.12 Future plans

Coming soon.

CHAPTER

THREE

INDICES AND TABLES

- genindex
- modindex
- search