

# GM/CA Plans for the Eiger 16M

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# GM/CA Detectors

- Two ID lines for MX
- Detectors
  - Pilatus 6M and MAR300
  - Received Eiger X 16M earlier this month
  - First Eiger users in mid-June
- Eiger image consumers
  - JBlulce-EPICS acquisition software contains an integrated viewer
  - SpotFinder for data collection and raster
  - GMCAProc and fast\_dp automated processing
  - Need to support XDS, HKL2000, MOSFLM



Rayonix MAR 300



Dectris Pilatus 6M

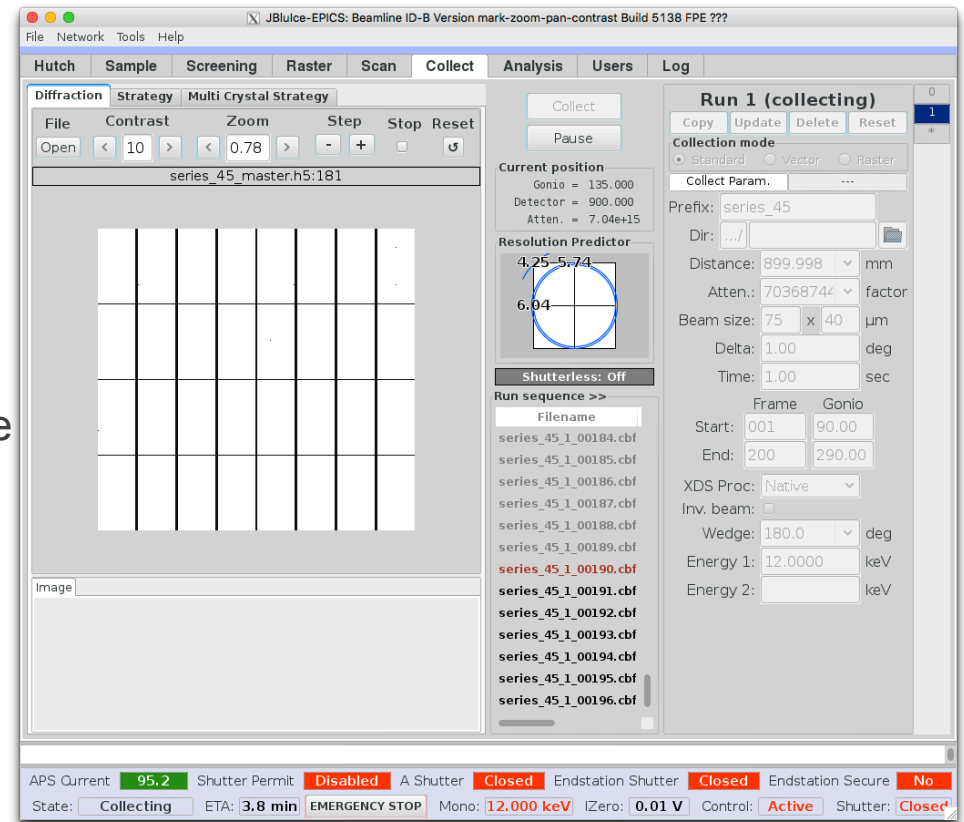


Dectris Eiger 16M



# JBlulce viewer

- Previously we used the SSRL Image Server which loads MAR (TIFF) and CBF images
- Decided to add native image loading to JBlulce
  - Image directory is polled at 2Hz
  - Latest image is loaded as available
  - We are testing various data file sizes from single image to 100/file

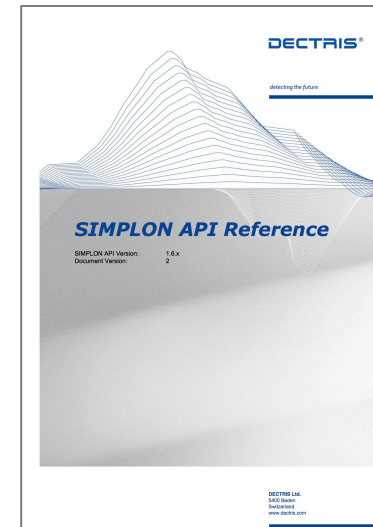


JBlulce with integrated HDF5 viewer  
(in development)

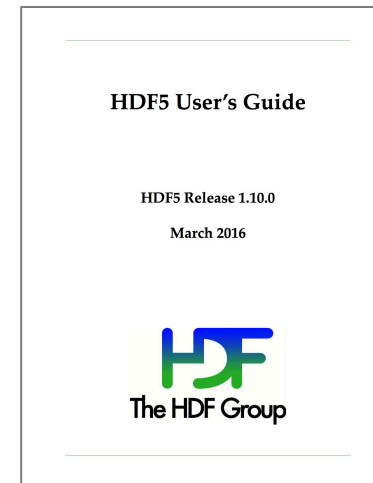


# JBlulce viewer plans

- Comparison of HDF5 to the Eiger Monitor
  - Advantages
    - One pipeline can read images during collection and previous images
    - Less load on the DCU
    - No proxy is needed to read images from the Eiger monitor and re-serve them
  - Disadvantages
    - May introduce lag but doesn't seem noticeable
    - Adds a small amount of file system usage
    - Requires limiting the number of frames per data file until the Eiger is upgraded with HDF5-1.10 and SWMR support
    - Requires the file system to keep up with collection
- We may still use the Eiger monitor if testing shows it's necessary



SIMPLON reference including Monitor

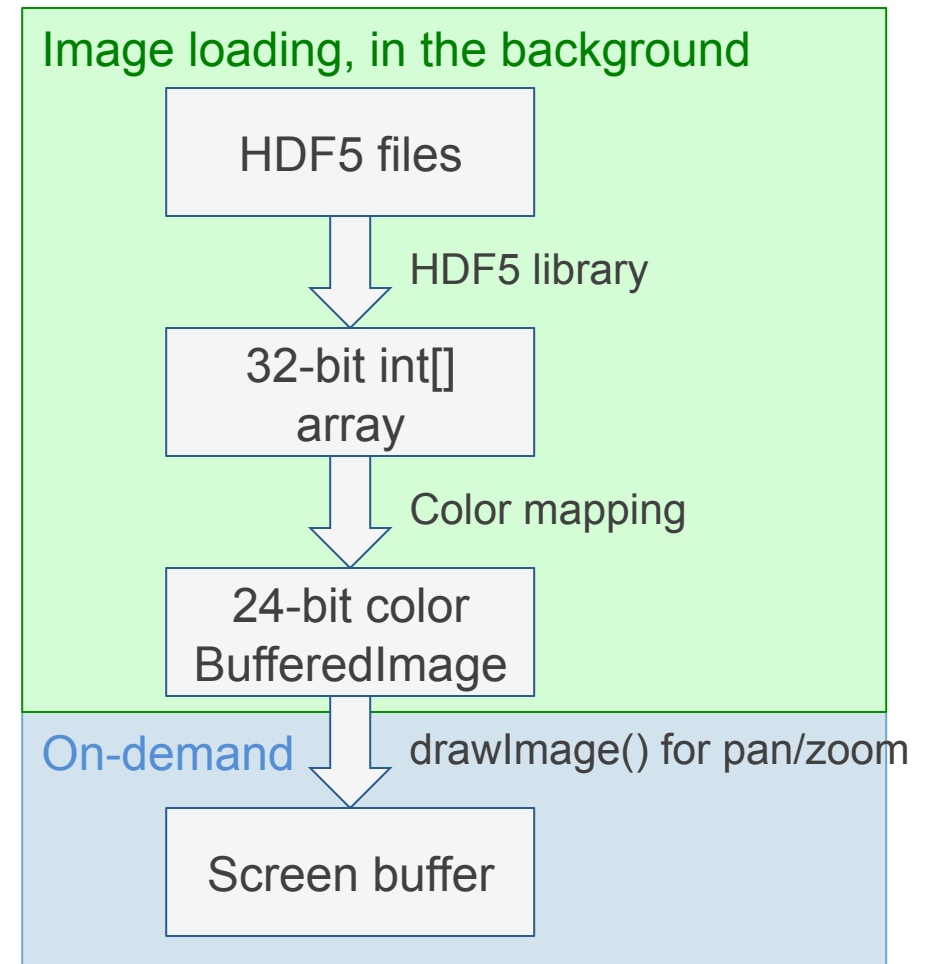


HDF5 reference



# JBlulce: Loading HDF5

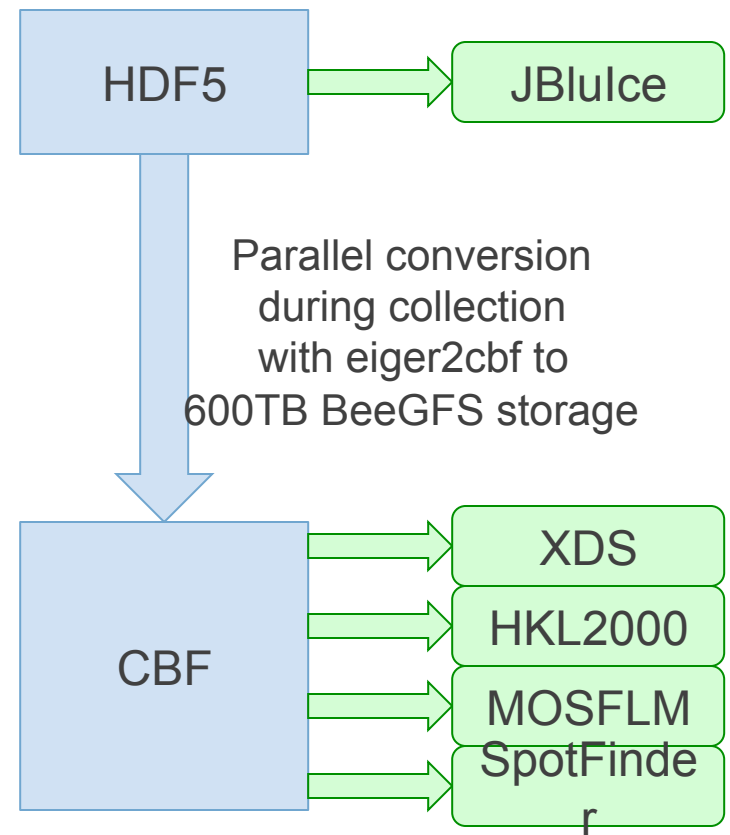
- HDF5-1.10 Java library
  - Added LZ4 and bitshuffle plugins
- Image loads into a 32-bit int[] array
  - Referred to for displaying pixel values
- Values are mapped to 24-bit color
  - For now we're mapping to 8-bit grayscale
  - Later, other maps will be added
- Finally, drawImage applies pan and zoom, and writes to the screen-sized buffer



JBlulce Eiger image pipeline

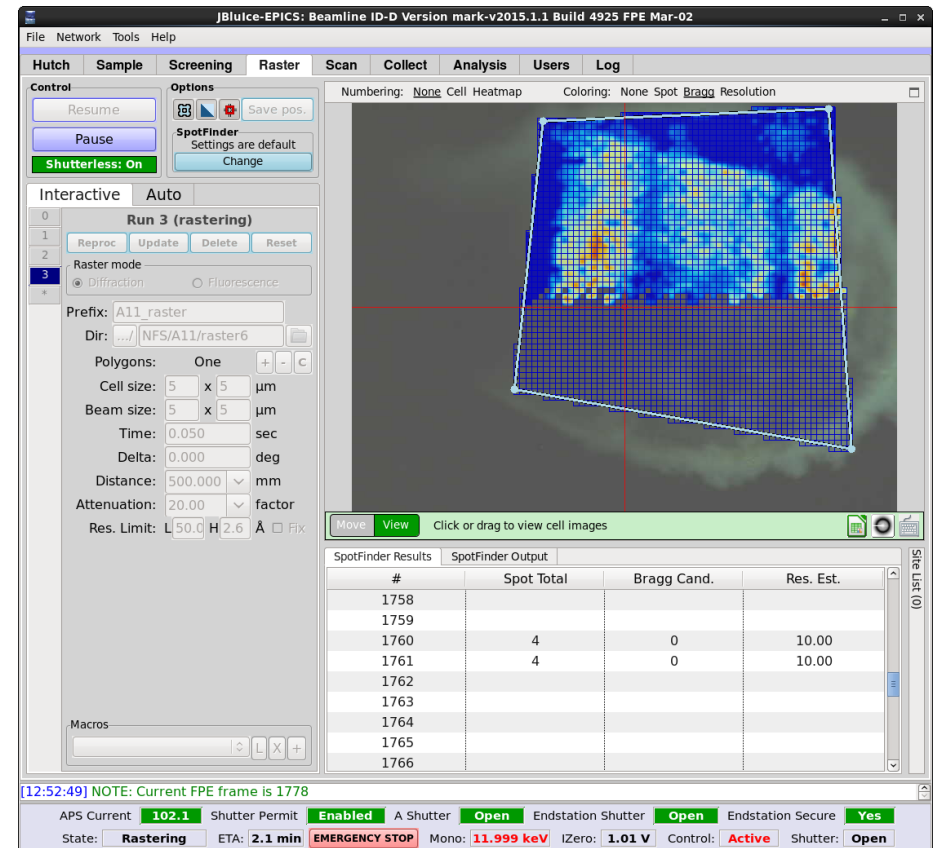
# Processing: CBF conversion

- HDF5 files will be converted to CBF for processing software that requires it, using eiger2cbf
- The data directory will be polled, and as data files are available an eiger2cbf process will be started
  - Decision about the number of frames per HDF5 data file will be based on testing



# Raster

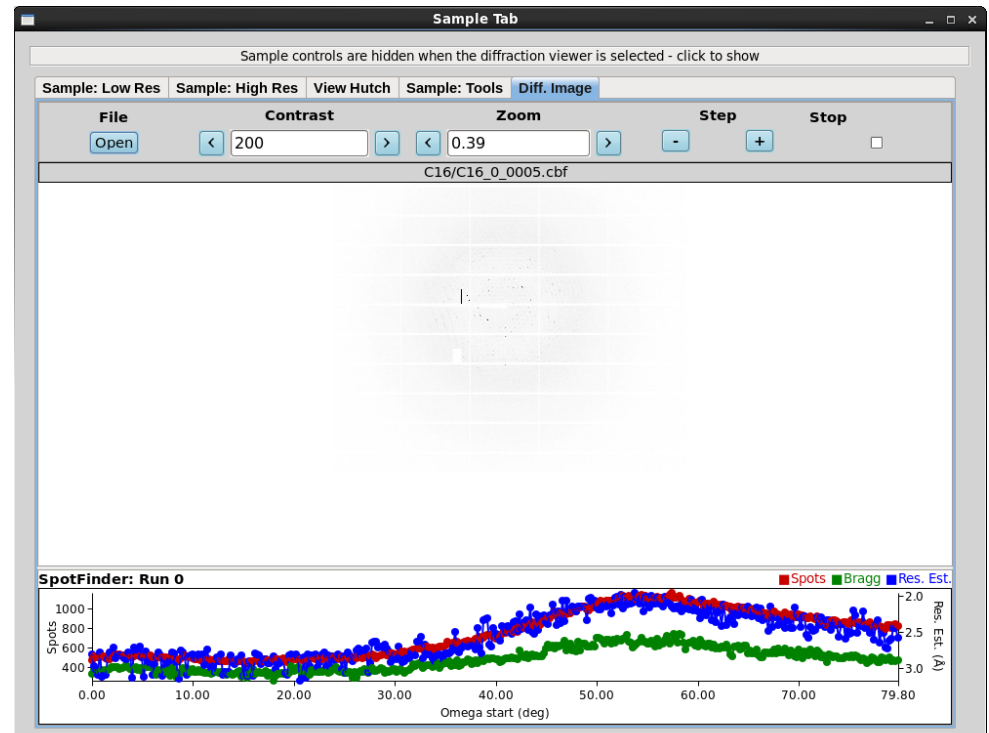
- Raster operation
  - User sets up 2D grid of cells to take diffraction images at
  - Each row is collected without closing the shutter
  - SpotFinder is run on each image to determine spot count and resolution estimate
- Plans
  - Run SpotFinder on 8 cores x 4 workstations as before, using the Apache server version
  - At most, CBF conversion will need to wait until a row is collected to start, but we may use smaller image counts per data file



JBluce Raster tab

# SpotFinder graph

- A few images per second are processed to assess crystal quality
- Helps to diagnose issues like misalignment or radiation damage
- As data files are converted to CBF, SpotFinder will be run



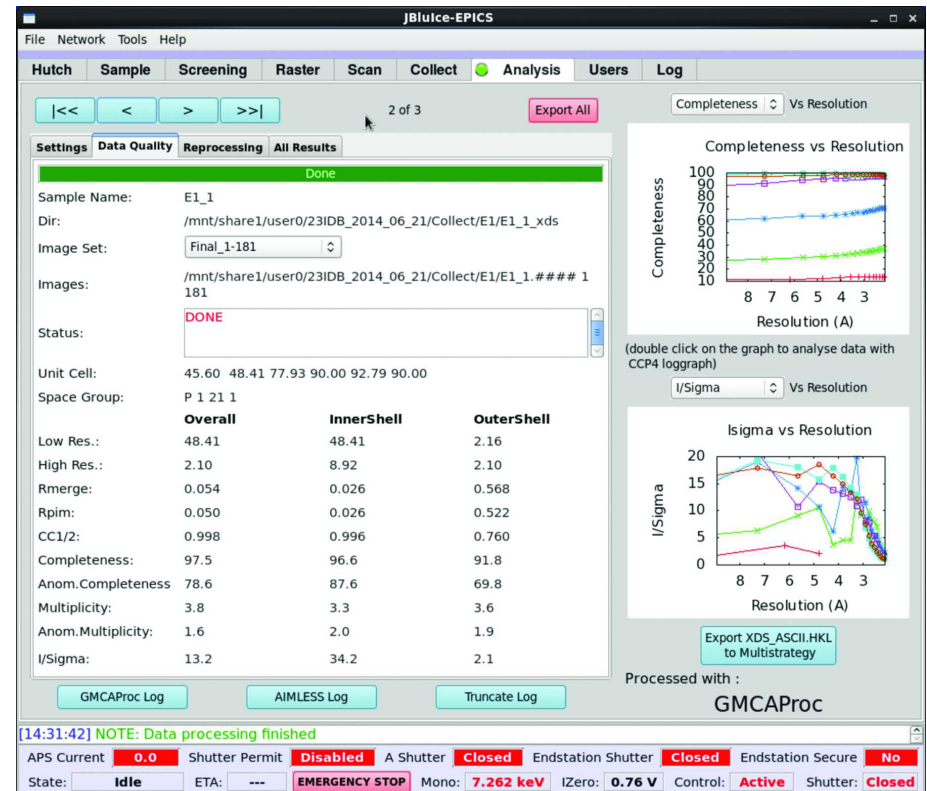
JBlulce SpotFinder graph





# GMCAProc/fast\_dp and XDS

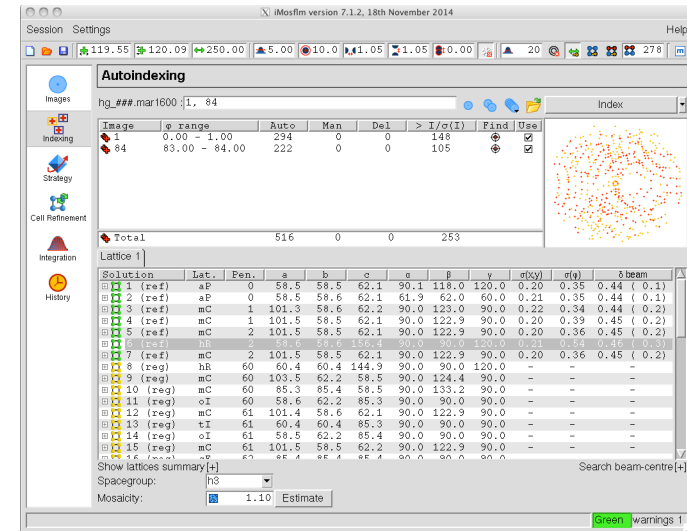
- We are following instructions from the XDSwiki
  - eiger2cbf is listed as a converter which works with XDS
  - We are using the XDS\_from\_H5.py converter
- We will point XDS to our converted CBF files
  - Unless using H5ToXds is faster
- GMCAProc
  - Minimal other changes are needed
  - Ready to test with our own diffraction images
- fast\_dp
  - Awaiting a new version which supports eiger2cbf-converted images



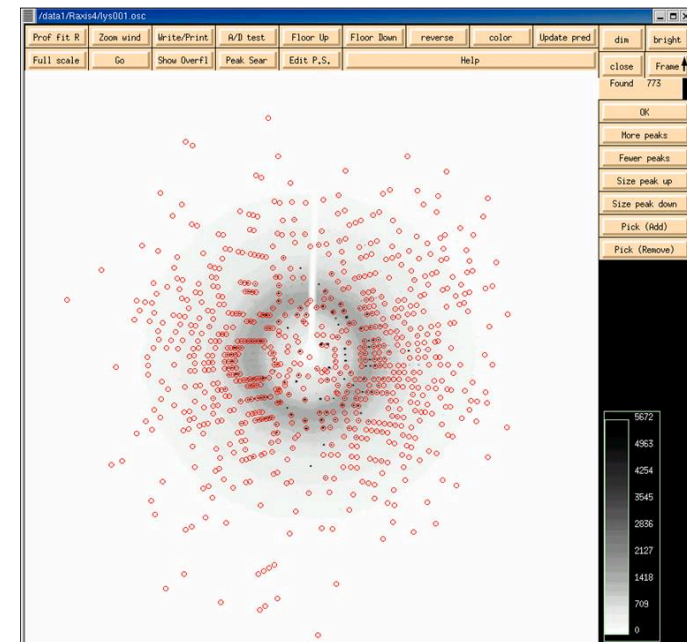
GMCAProc output in JBlulce

# HKL2000 and MOSFLM

- We will test HKL2000 and MOSFLM on converted CBF images



iMosflm



HKL2000



# Thanks

## GM/CA

Sergey Stepanov

Oleg Makarov

Michael Becker

Craig Ogata

Ruslan Sanishvili

Nagarajan Venugopalan

Robert F. Fischetti

## SpotFinder

Nick Sauter

## fast\_dp

Graeme Winter

