Data analysis at SACLA

Sample data

Pump (800 nm laser)-probe (XFEL) X-ray diffraction measurement for Bi thin film

- BL: 3
- Scan motor name: "xfel_bl_3_st_2_motor_1/position" (delay stage of laser)
- Run number: 714350~714560
- Delay scan range: -2550 ~ -1650 pulse, 5 pulse step (1pulse = 6.671 fs)
- I0 signals: "xfel_bl_3_st_2_pd_user_4_fitting_peak/voltage" & "xfel_bl_3_st_2_pd_user_5_fitting_peak/voltage"
- MPCCD Background: Run# 714259
- Timing Monitor Background: Run# 713326

1. Login SACLA HPC system

1. Connect the SPring-8 network with VPN service
2. $ssh -X (username)@xhpcfep
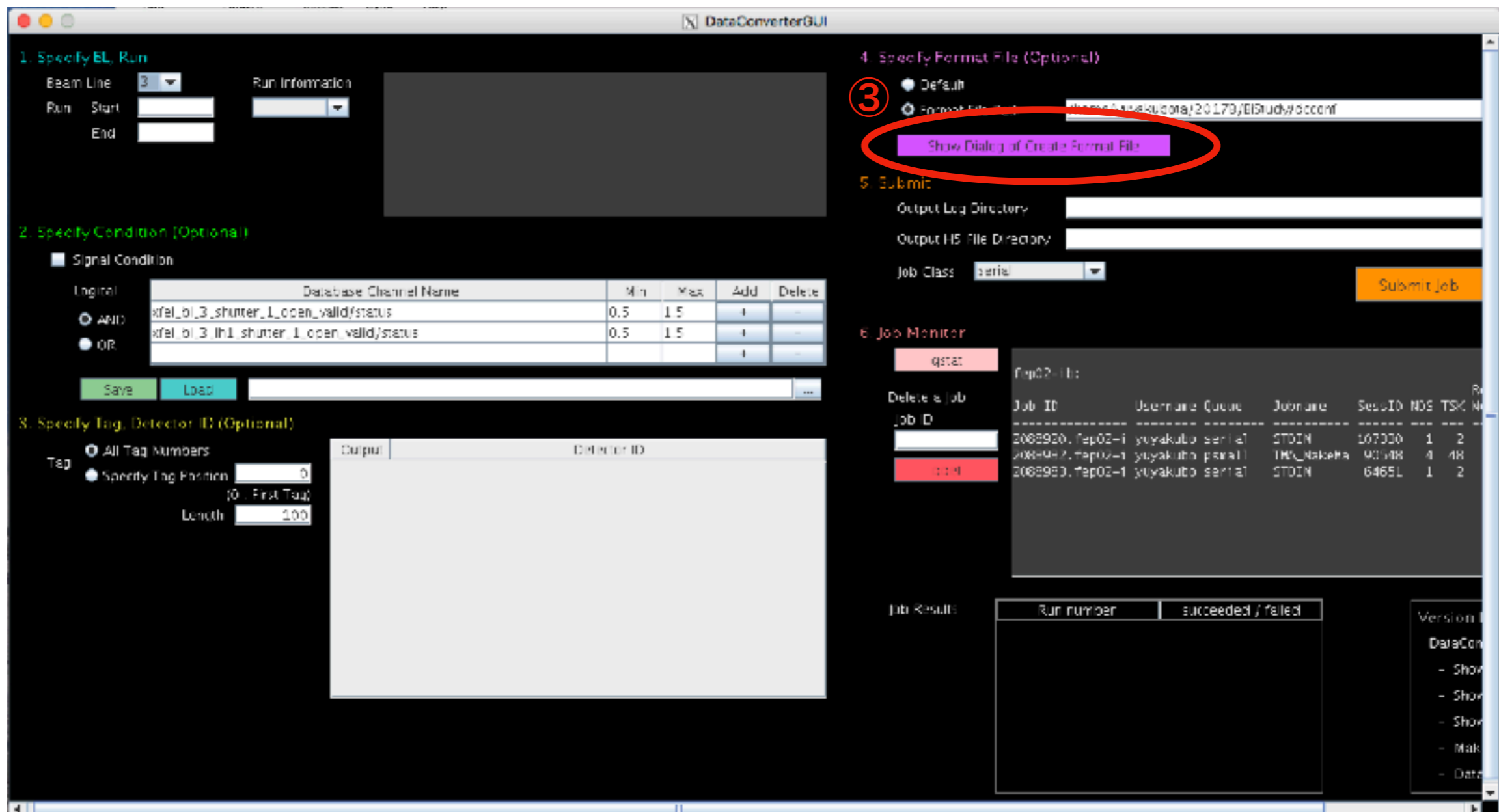3. $qsub -I -X -l select=1:ncpus=2

Reference
HPC Portal site (via VPN)
http://xhpcfep.hpc.spring8.or.jp

2. Extract data from the DB and the Storage

1. **Make a configure file for DataConvert**
   1. $DataConverterGUI
   2. Open GUI window
   3. Click Show Dialog of Create Format File

2. Extract data from the DB and the Storage

1. **Make a configure file for DataConvert**

   4. Add signals you want

   5. save your configure file

2. Extract data from the DB and the Storage

1. **Make a configure file for DataConvert**

• Reference

http://xhpcfep.hpc.spring8.or.jp/assets/docs/DataConverterGUI_UsersManual_en.pdf

• Please use a sample configure file (including signals of I0 and delay stage)
/work/yuyakubota/Sample/DataConvert_sample.conf

2. Extract data from the DB and the Storage

2. DataConvert

1. $MakeTagList -b 3 -r (Run#) -out (file name1).list
2. $DataConvert4 -l (file name1).list -dir (derectory name) -o (file name2).h5

To use your config file, please add a command option "-f".

$DataConvert4 -l (file name1).list -dir (derectory name) -o (file name2).h5 -f (config file name)

- Reference

MakeTagList: http://xhpcfep.hpc.spring8.or.jp/assets/docs/MakeTagList_UsersManual_en.pdf
DataConvert: http://xhpcfep.hpc.spring8.or.jp/assets/docs/DataConvert4_UsersManual_en.pdf

- Examples of results for Run# 714350

/work/yuyakubota/Sample/714350.list and 714350.h5

2. Extract data from the DB and the Storage

Sample of HDF file (714350.h5) for Run# 714350

3. Result of the scan

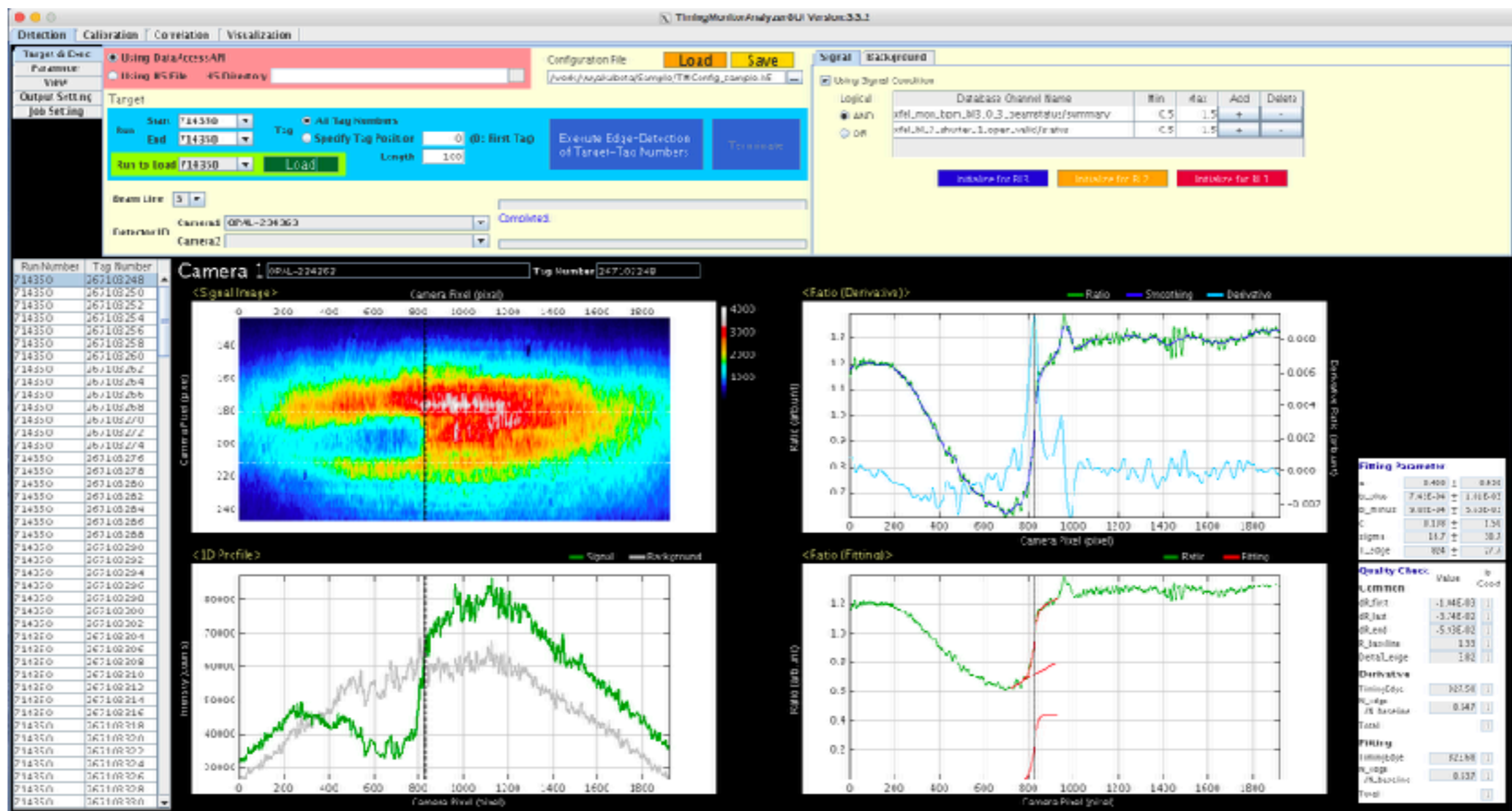**Please analyze the data in HDF files**
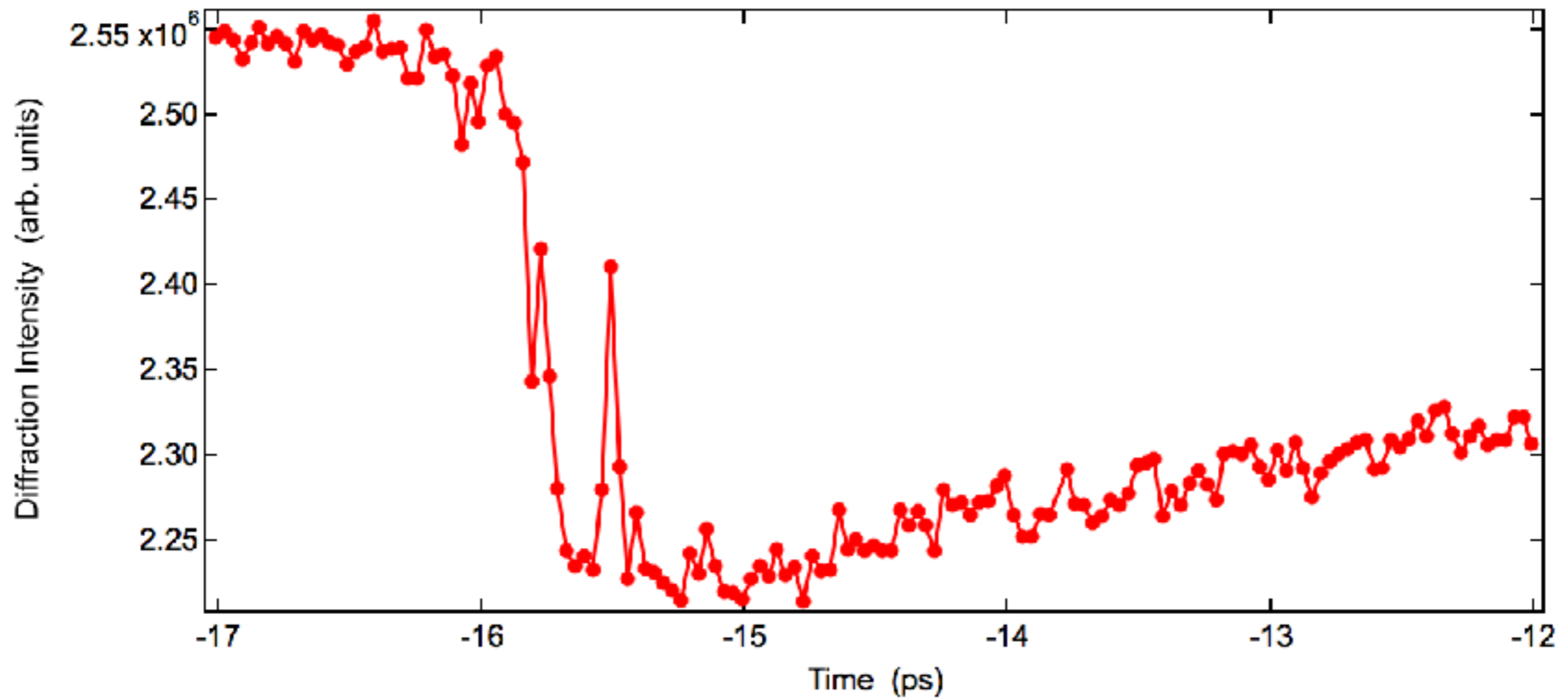
4. Jitter correction with Timing Monitor

1. **Analysis of timing jitter using TimingMonitorAnalyzer**
    1. $TimingMonitorAnalyzerGUI
    2. Open GUI window

4. Jitter correction with Timing Monitor (TM)

1. Analysis of timing jitter using TimingMonitorAnalyzer

Please refer to

http://xhpcfep.hpc.spring8.or.jp/assets/docs/
TimingMonitorAnalyzerGUI_UsersManual_en.pdf

Please use a configure file
/work/yuyakubota/Sample/TMconfig_sample.h5

Examples of Result files for Run# 714350
/work/yuyakubota/Sample/714350.tma.h5 and 714350.csv and 714350.png

4. Jitter correction with Timing Monitor (TM)

Sample of HDF file (714350.tma.h5) for Run# 714350

4. Jitter correction with Timing Monitor (TM)

1. Analysis of timing jitter using TimingMonitorAnalyzer

quality check: 1 = good, 0 = not good

Delay time (fs) = [delay stage position (pulse)]*6.671 (fs) - ([jitter position] (pixel) - [Average of jitter position] (pixel)) * 3 (fs)

5. Result of the scan with jitter correction