National Synchrotron Light Source II





Integrated control of a chip scanner for time-resolved crystallography at the NSLS-II FMX beamline

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What is it?



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What is it?

Chips from DLS

Uses

- Room temperature crystals
- Can get simple crystal measurements
 - With enough, can solve structures
 - Need lots of samples (~10000)
- Pump probe (with laser elsewhere, chemical injection here currently)
 - With varying delay times, ~10ms 2s

Epics controls

Low Mag High Mag

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					Acquire	
				Config	Start	Stop
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				Gain	25.000	25.000
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Bluesky controls

- Ophyd Object
- Bluesky Plans
- Run through notebook, IPython (BSUI), Queueserver



Hardware Challenges

• Well locations slightly off

• Droplet injector clogging

• Motors freezing in the "moving" state

Hardware Solutions

- Well locations slightly off
 - Take additional fiducials
- Droplet injector clogging
 - Check before and after scans
- Motors freezing in the "moving" state
 - "Sentinel" IOC watches for this, resolves, and emits metadata for user processing about the scan points



User facing controls

- Ophyd Object
- Bluesky Plans
- Run through notebook
- Also through GUI
 - Ongoing Development
 - Credit to Shekar
 - Runs through Webserver



Lessons learned

- Don't reinvent the wheel
 - Ask for help
- Prepare for things to break or bend
 - Harden software as best as possible against strange hardware issues
 - Make sure to have lots of spares
 - Lots of time for testing and refactoring is required