

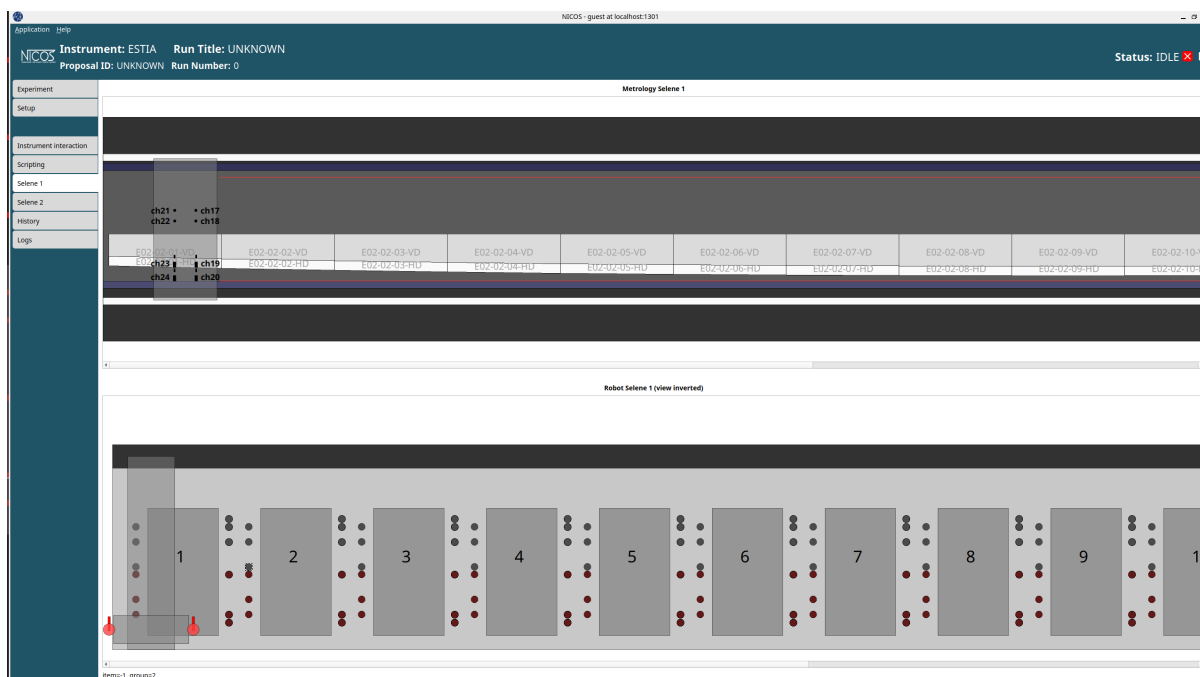
Topic	Description	Details / To-Do list	Priority
Achievements	Data reduction: Notebooks and widget-based GUI to reduce divergent NR using scipp tools Implemented polarisation corrections for polariser and flipper efficiencies using the ESSpolarisation library Analyzer: optimisation through McStas simulations Detector integrated testing: Detector mounted and cabled, displays correct injected signals to individual pixels using local timing for TOF calculations. NeXus template: Defined coordinate system for Estia and added detector geometry and chopper info	Divergent reflectivity measurements data can be reduced to a 1D curve and saved as .ort ORSO standard file format ESSpolarisation is the common python library to treat polarisation at ESS. Estia's polarisation correction workflow has been ported and tested by using the common library McStas simulations have been used extensively to provide details for the design of the analyser which is required for the instrument TG5 (the detailed design, not the delivered analyser) Connection of detector to the global timing network and the kafka data stream service is happening right now as of 9/10 This required more discussions than I had foreseen in order to mediate between a functional coordinate system and something that is shared across instruments	

Remaining tasks	Data reduction: Add GUI functionalities and implement reduction from NeXus file NeXus template: Live data view	Reduction GUI is functional but still needs features that expand usability and flexibility in interacting with the different scipp/sciline reduction workflows on top of which it is built. Scicat integration is also currently missing Implementing reduction from NeXus file is imminent as detector geometry has been added to the file and very recently also chopper information. Continuing to populate the NeXus template and add entries as PVs are created and integrated for the various components on the beamline. Storage of polarised data in the NeXus file also needs to be implemented ESSlivedata has been tested for diffraction showing great performance and flexibility. Reflectometry will be implemented the based on the same framework	Complete NeXus template for Estia Implement reduction from NeXus Implement Live data for reflectometry
Bottlenecks & dependencies	Many things rely on having a reliable and complete NeXus file template	We have recently gotten new staff to support reflectometry in ECDC which is helping a great	

		deal with speeding up this task	
Software / Calibration tools	NICOS selene guide alignment tool Detector utility (MBUTY)	This GUI has been developed to align the 60 mirrors (15*4) of the selene guide by controlling an interferometer robot that moves along the guide and adjusts the tilt of the mirrors (Appendix 1) Comprehensive GUI that enables monitoring processes across the whole data acquisition system in detail (Appendix 2)	
Software / Data reduction tools	Jupyter Notebooks for divergent and collimated reduction of reflectivity data Widget-based GUI for reducing multiple datasets. (Appendix 3)	Workflows for reducing divergent reflectometry have been developed	Streamline reduction of large numbers of datasets Implement reduction for polarization analysis
Software / Data analysis tools	EasyReflectometry (Appendix 4) refnx and genx	ER is the reflectometry software built on the Easy Science framework developed at ESS. The software is composed of a python library and an app. The library is already functional whilst the app is partially functional and under development. Some updates are given below. Established reflectivity analysis software are	Testing and provide reliable feedback to the developer team

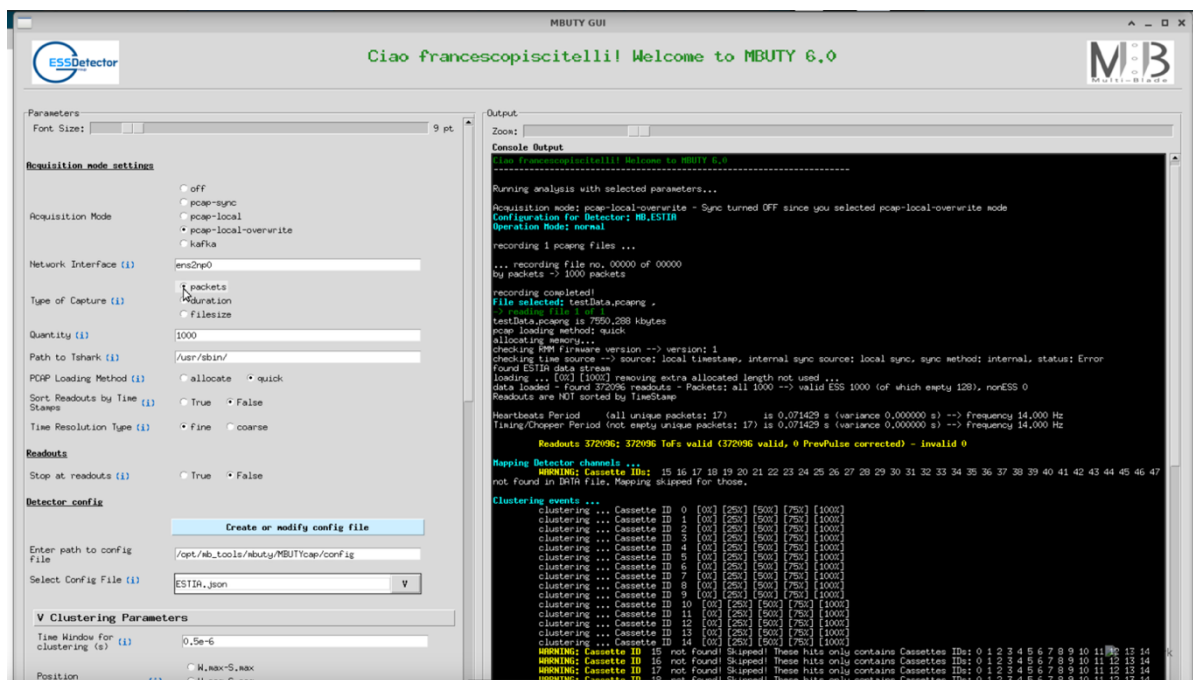
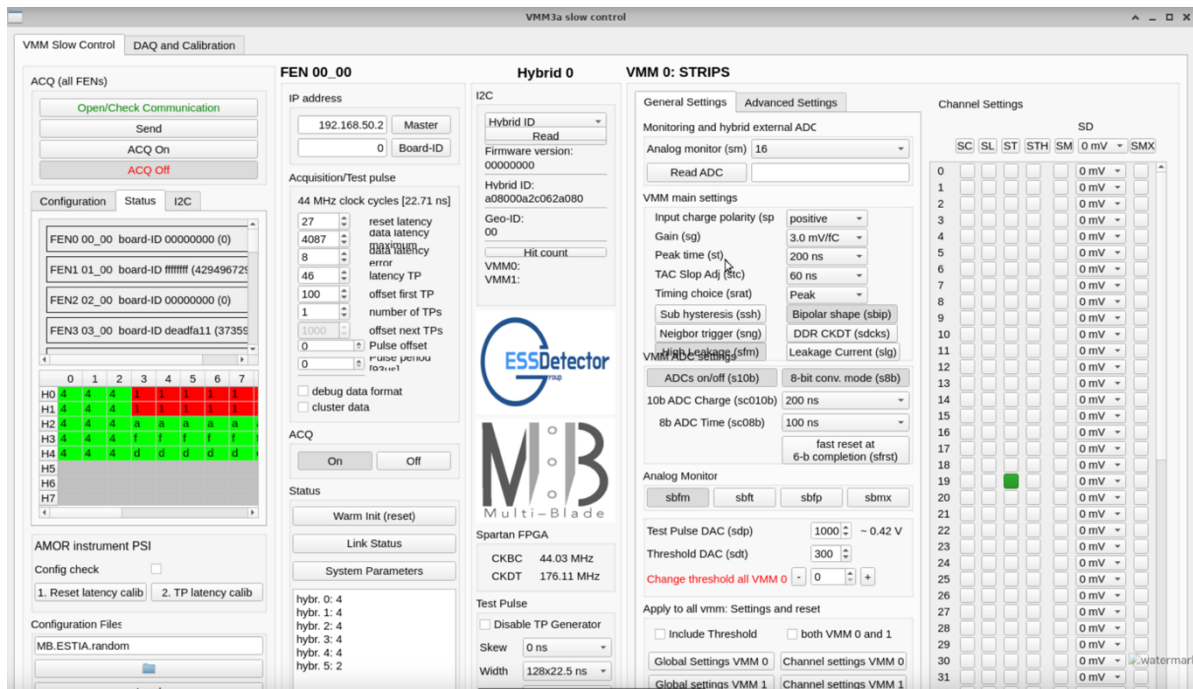
		installed and available on VISA	
Software	Plans for deployment		
SAR	Foreseen for Feb 2026.		

Appendix 1: Selene guide alignment tool



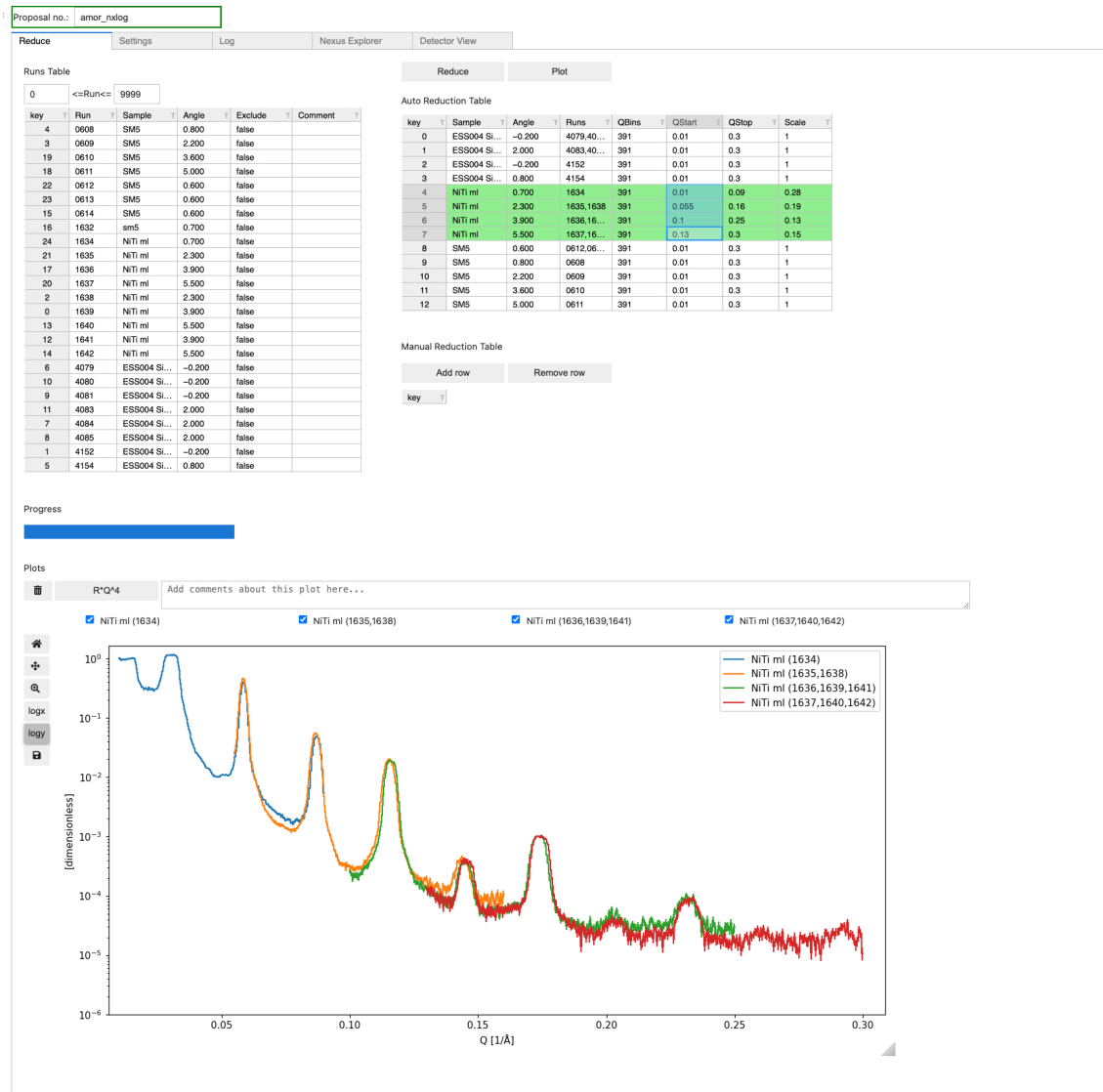
Interactive NICOS tool for the alignment of the selene guides showing the robot-interferometer on the left and the screws for the adjustment of the individual mirror section of the selene focusing system. Python control interface allows for streamlined alignment procedures. Tested on one of the two selene guides

Appendix 2: MBUTY detector utility



MBUTY 6.0 is the latest version of the MultiBladeUTILitY software that allows direct access to all of the detector diagnostics tools and detector functionalities developed by the detector group. Amongst the functionalities the software can also display live data in Xpixel vs Ypixel or pixel vs TOF and it has been extensively tested. It's the current live data view available on AMOR at PSI which uses the same detector as ESTIA.

Appendix 3: Data reduction GUI



Widget-based python GUI for reducing 2D detector images into one reflectivity profile.

Left-hand table shows measured datasets with editable properties.

In the Right-hand table measurements are grouped based on the measurement name and angle. Once processed through the scipp reduction workflow the table shows processed rows in green. Plots are generated at the bottom of the page with interactive commands, the ability to hide individual datasets, and other functionalities such as $R \cdot Q^4$ conversion and adding comments to the plot. Generated plots can be saved for use in the logbook or individually deleted

Proposal no.: amor_mdlog

Reduce Settings Log Nexus Explorer Detector View

Nexus Explorer

Runs Table

key	Run	Sample	Angle	Exclude	Comment
4	0608	SM5	0.800	false	
3	0609	SM5	2.200	false	
19	0610	SM5	3.600	false	
18	0611	SM5	5.000	false	
22	0612	SM5	0.600	false	
23	0613	SM5	0.600	false	
15	0614	SM5	0.600	false	
16	1632	sm5	0.700	false	
24	1634	NTi ml	0.700	false	
21	1635	NTi ml	2.300	false	
17	1636	NTi ml	3.900	false	
20	1637	NTi ml	5.500	false	
2	1638	NTi ml	2.300	false	
0	1639	NTi ml	3.900	false	
13	1640	NTi ml	5.500	false	
12	1641	NTi ml	3.900	false	
14	1642	NTi ml	5.500	false	
6	4079	ESS004 Si...	-0.200	false	
10	4080	ESS004 Si...	-0.200	false	
9	4081	ESS004 Si...	-0.200	false	
11	4083	ESS004 Si...	2.000	false	
7	4084	ESS004 Si...	2.000	false	
8	4085	ESS004 Si...	2.000	false	
1	4152	ESS004 Si...	-0.200	false	
5	4154	ESS004 Si...	0.800	false	

File Structure

- connection_status_time ((0), uint64)
- cue_index ((0), uint32)
- cue_timestamp_zero ((0), uint64)
- maximum_value ((1), float64)
- minimum_value ((1), float64)
- time ((1), uint64)
- value ((1, 1), float64)
- ratio
- rotation_speed
- definition ((1), object)
- detector
 - data
 - cue_index ((0), uint32)
 - cue_timestamp_zero ((0), uint64)
 - event_id ((22929616), uint32)
 - event_index ((194360), uint32)
 - event_time_offset ((22929616), uint32)
 - event_time_zero ((194360), uint64)
 - event_time_zero_index ((194360), uint32)
 - polar_angle
 - proton_current
 - transformation
 - diaphragm_1
 - diaphragm_2
 - diaphragm_3

Content

Dataset content:
Shape: (194360,)
First few values:
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1255 1291
1489 1622 1826 1862 1972 2021 2218 2254 2357 2376
2597 2715
2730 2923 3039 3072 3278 3394 3430 3614 3728 3769
4085 4129
4329 4370 4483 4706 4742 4857 4885 4929 5127 5234
5240 5445
5575 5618 5809 5909 5940 6149 6251 6296 6492 6588
6615 6728
6929 7145 7177 7300 7426 7480 7558 7674 7710 7743
7948 8060
8064 8266 8382 8403 8612 8724 8758 8960 9077 9105
9312 9432
9470 9587 9797 10012 10147 10182 10312 10348 10419 10532
10571 10769
10908 10956 11152 11270]
...

Proposal no.: amor_mdlog

Reduce Settings Log Nexus Explorer Detector View

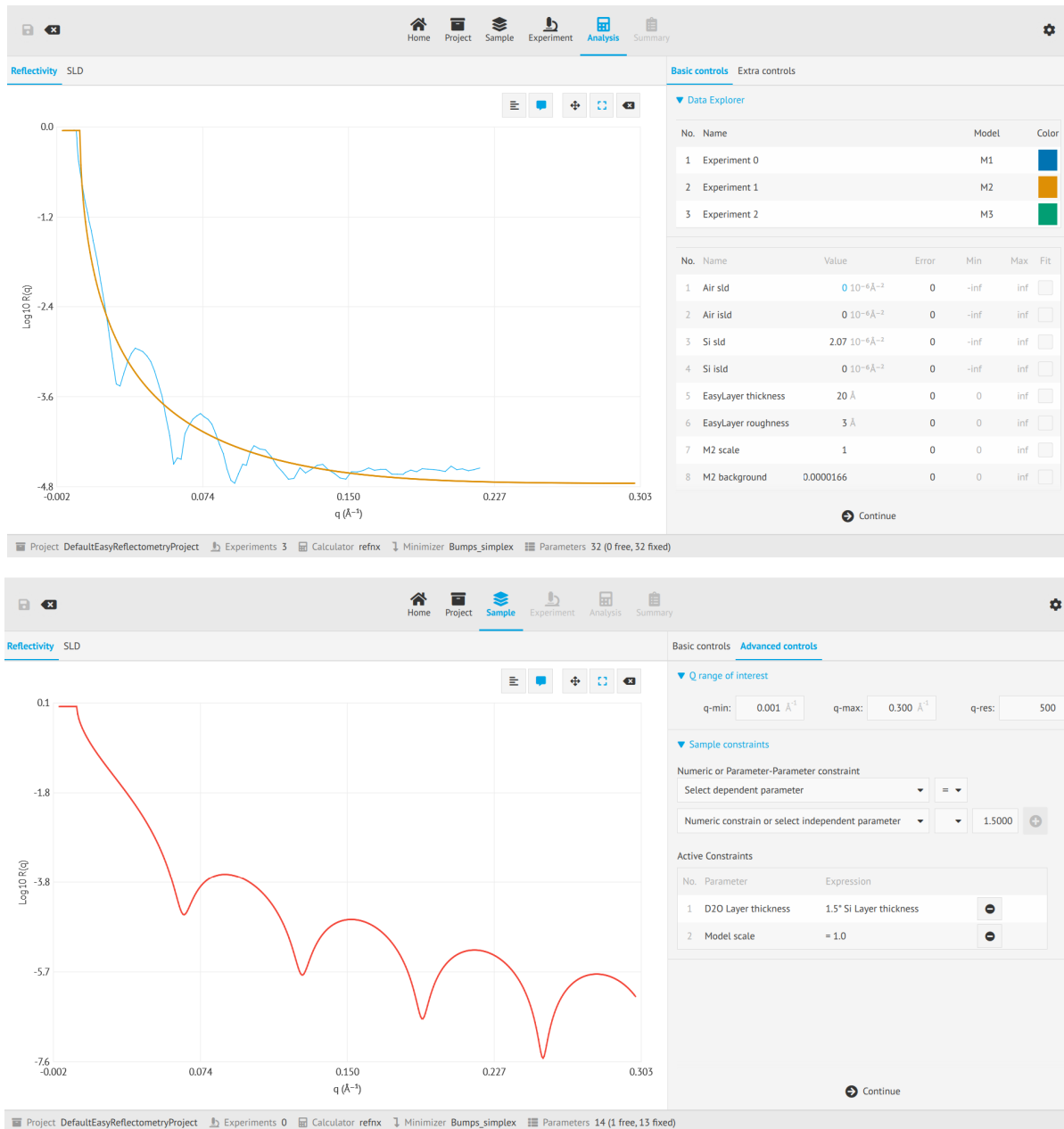
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5	4154	ESS004 Si...	0.800	false	

Wavelength z-index counts distribution

Other tabs of the reduction GUI include a NeXus file explorer which enables quick access to basic information stored in the nexus file and a 2D detector viewer to display the detector image for each measurement

Appendix 4: Easy Reflectometry App



Screenshots of Easy Reflectometry App . On the top implementation of multiple models (M1, M2, M3) to constrain multiple contrast measurements (currently only displayed one at the time in the plot but will be soon displayed simultaneously). On the bottom implementation of parameter constrains to impose relationships between parameters in each model and across multiple models.