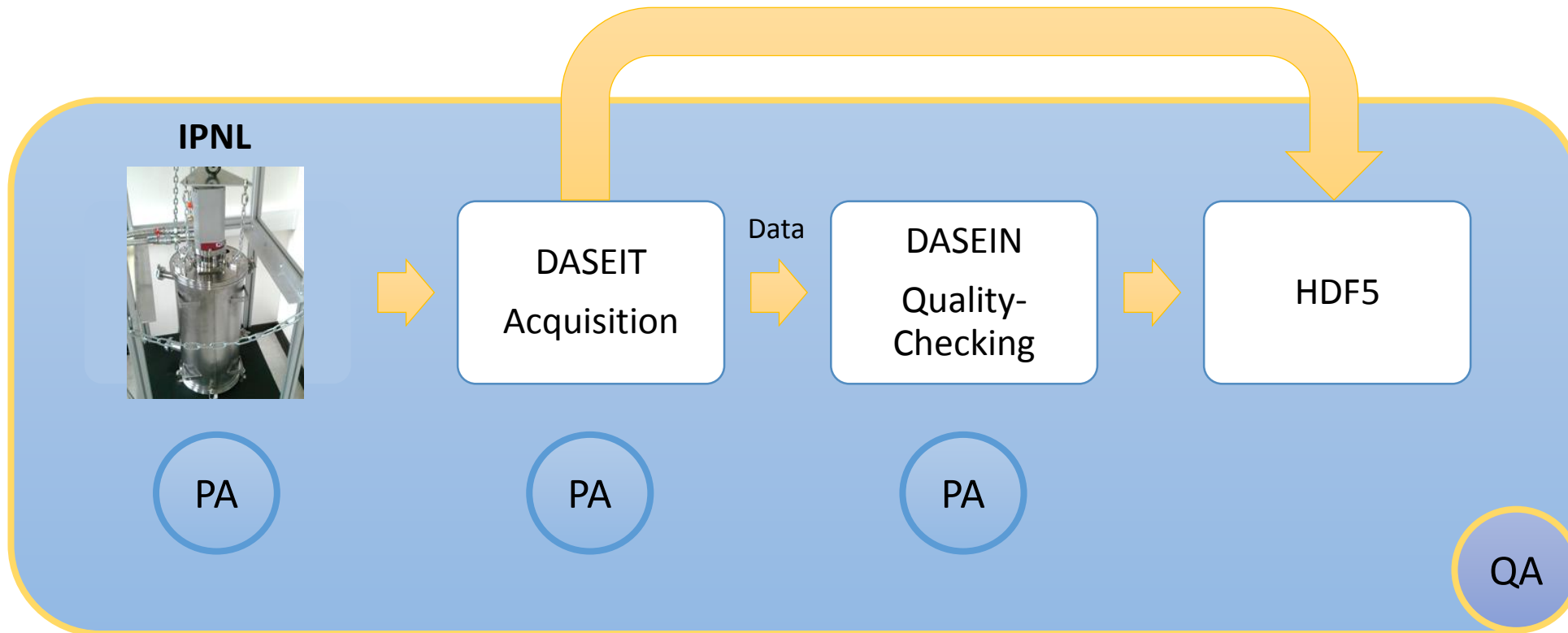




2.5. PA QA Software

1) PA QA SW approach

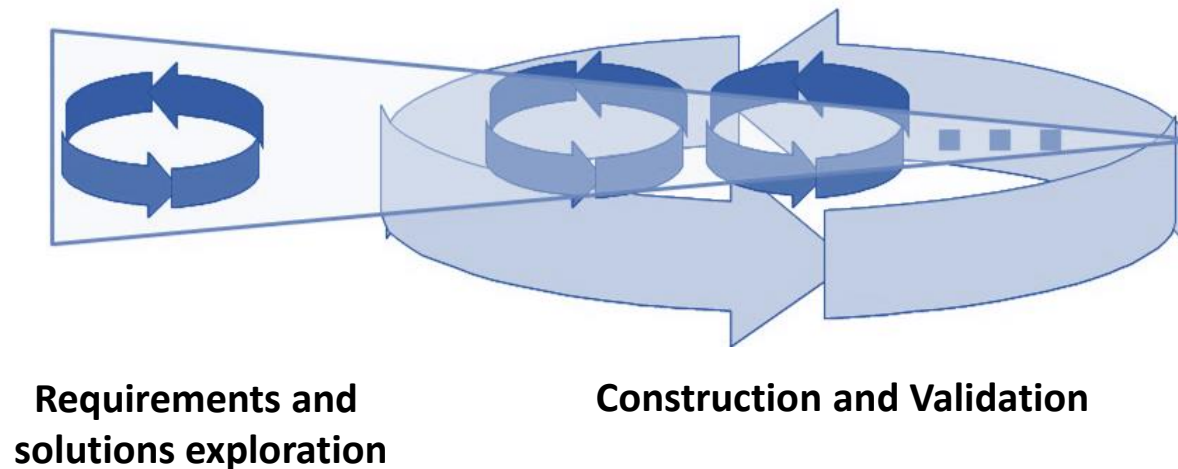


2) Software development lifecycle / Development methodology

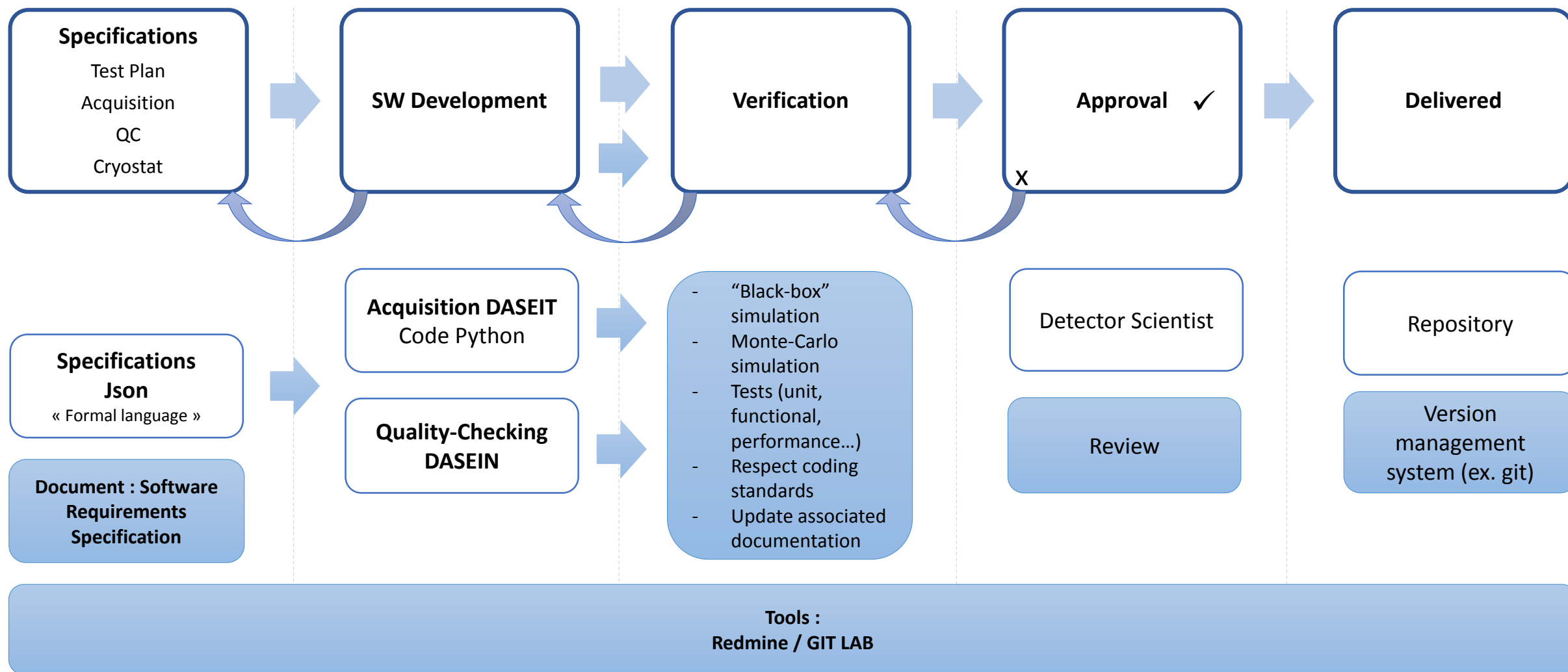
- “Scrum” model
- Starting from specifications tree
- Using (Semi) iterative process

Adapt PA/QA to small team

- 1 scientist for specifications
- 2 software developers
- 1 PA/QA manager



2) Software development lifecycle / Development methodology



3) Tools and methodologies

- **Project management tool : REDMINE / GITLAB**
 - All requirements are reported and identified
 - Bugs reports management, change requests, tasks definition.
 - E-mail notification
- **Version management tool : GIT**
 - The “master” branch containing the currently produced code
 - The " release " branch serving to prepare the next delivery
 - The “new” branch containing the code in the process of test
- **Automatic documentation generation tool : SPHYNX**
 - Generate documents in PDF, HTML... from restructured texts
 - Generate the detailed documentation from the source code
 - Generate Software Test Plan and Report from Functional Tests code

4) Test and practice standards

- Unit testing / Component testing
- Functional / Acceptance testing
 - Software Test Report, ref: IPNL-EUCL-STR-01-01
 - Daseit STR : EGSE/EGSE-simulation, SC/SC-simulation
 - Dasein STR : HDF5 data (raw or EGSE-montecarlo simulation)
- Performance testing
- Integration testing (according to CPPM)
 - Daseit / Slow Control Interface Validation Report, ref: IPNL-EUCL-SCIVR-01-01



4) Test and practice standards

- Unit testing

Test pieces of code

```
test01_rec_filedir (t_das.Test_DAS) ... ok
test02_rec_filepath (t_das.Test_DAS) ... ok
test_bug_4941 (t_das.Test_DAS) ... ok
test01_run (t_mesure.Test_Mesure) ... ok
test02_add_sequence (t_mesure.Test_Mesure) ... ok
test02_del_last_sequence (t_mesure.Test_Mesure) ... ok
test03_to_json (t_mesure.Test_Mesure) ... ok
test_bug_5342 (t_mesure.Test_Mesure) ... ok
test_feature_11017 (t_mesure.Test_Mesure) ... ok
test_exposure_start (t_monitoring.Test_Monitoring) ... ok
test_sum_outputs (t_monitoring.Test_Monitoring) ... ok
test01_init_close (t_recording.Test_Recording) ... ok
test02_tis (t_recording.Test_Recording) ... ok
test03_tis_empty (t_recording.Test_Recording) ... ok
test04_exposure_attrs (t_recording.Test_Recording) ... ok
test05_global_attrs (t_recording.Test_Recording) ... ok
test06_class_image_attr (t_recording.Test_Recording) ... ok
test_feature_4088 (t_recording.Test_Recording) ... ok
test_bug_7611 (t_sc.Test_SC) ... ok
test01_property (t_sc_config.Test_SC_Config) ... ok
test02_float_getter (t_sc_config.Test_SC_Config) ... ok
test03_float_setter (t_sc_config.Test_SC_Config) ... ok
test04_invalid_property (t_sc_config.Test_SC_Config) ... ok
test05_readable_params (t_sc_config.Test_SC_Config) ... ok
test06_writable_params (t_sc_config.Test_SC_Config) ... ok
test_feature_4764_bool_getter (t_sc_config.Test_SC_Config) ... ok
test_feature_4764_bool_setter (t_sc_config.Test_SC_Config) ... ok
test_feature_4765 (t_sc_config.Test_SC_Config) ... ok
test_feature_4539 (t_tis.Test_TIS) ... ok
test01_frame_mode (t_tis_config.Test_TIS_Config) ... ok
test04_vertical_window (t_tis_config.Test_TIS_Config) ... ok
test10_mcd (t_tis_config.Test_TIS_Config) ... ok
test10_mcd_tab_space (t_tis_config.Test_TIS_Config) ... ok
test11_param_modified (t_tis_config.Test_TIS_Config) ... ok
test11_param_not_modified (t_tis_config.Test_TIS_Config) ... ok
test_bug_11462 (t_tis_config.Test_TIS_Config) ... ok
test_feature_3858 (t_tis_config.Test_TIS_Config) ... ok
test_feature_4523 (t_tis_config.Test_TIS_Config) ... ok
test_nb_drops (t_tis_config.Test_TIS_Config) ... ok
test_vrefmain (t_tis_config.Test_TIS_Config) ... ok
test_bug_10400 (t_tis_mcd.Test_MCD) ... ok
```


Ran 41 tests in 1.047s

OK



4) Test and practice standards

- Functional testing → Software Verification and Validation Plan

Types of specification	Assessment	Specification	Comments
Interfaces	100% (12)		
Configuration & book keeping	100% (4)		
Dump Registers and Parameters	75% (2)	SC-3-02 : The Acq-SW shall store Telemetry separately and convert ADU in Volt or A depending on the telemetry value. The conversion function provided by JPL shall be used.	Telemetry is stored but not converted
Monitoring (DASEIN)	In progress (3)		
Data Quality Checking During the Run execution	100% (1) In progress (3)		
Pre-Processing and Data Storage (Dasein)	75% (5)	SC-6-02 : The Acq-SW shall store in a Log files the history of commands/configurations ran along the whole session (many Runs from cold down to warm up of the cryostat). A summary of the Run shall be reported. The list of parameter reported will be defined.	
Documentation Specification	100% (4)		
Tests Specification	100% (1) <i>In progress</i> (2)	SC-8-01 : The Acq-SW shall provide a list of functional test used to validate each update of the code. SC-8-02 : The Acq-SW and Analysis-SW shall provide a series of functional test to validate the full chain of processing by using simulated input ramps. The validation shall be performed on of the Analysis-SW FITS outputs (pixel maps).	Tests still in progress

4) Test and practice standards

- Performance testing

Performance indicators DASEIT	Results	Assessment
Robustness (no acquisition crash)	EGSE: Teledyne-SAM : PR1 (duration: 1 month) Valid files: nb:37, size:9.6TB / invalid files: nb:0, size:0.0B	✓
	EGSE: Teledyne-SAM : PR1b (duration: 26 days) Valid files: nb:33, size:9.5TB / invalid files: nb:0, size:0.0B	✓
Acquisition efficiency (0.5 TB / day)	Complete workflow : 5.7 TB / 11 days ($\cong 0.518$ TB /day)	✓

Performance indicators DASEIN	Results	Assessment
Processing < 1h / 1 TB	4h30 of processing / 5 TB of raw data ($\cong 1.1$ TB /day)	✓
Material limit : 16 CPUs / 40 Go RAMs (max.)	Use 40 Go RAMs	✓

5) Documentation

- Software Requirements Specification (SRS)

Reference: NI-SCS Characterization workflow specification (EUCL-IPN-RS-7-001) (Data-pack)

- Software Design Description (SDD)

Internal document : IPNL-EUCL-SDD-01-01

- Software Verification and Validation Plan (SVVP)

Internal document : IPNL-EUCL-SVVP-01-01

- Software Verification and Validation Report (SVVR)

Internal document : IPNL-EUCL-SVVR-01-01

- Software Delivery Report

Coming

- Software User Manual

Ongoing with CPPM

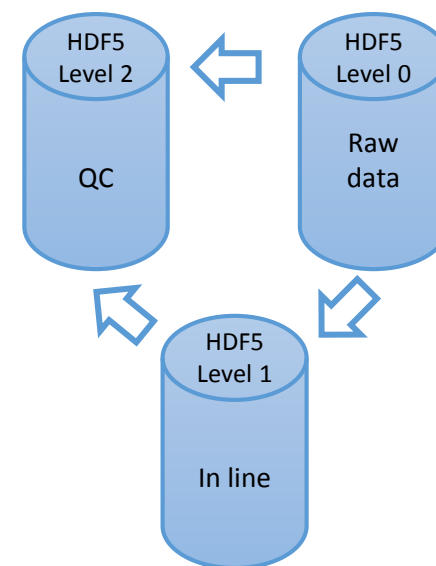
6) Output/produced data traceability

- All **data** : acquisition, slow control, quality check
- All **metadata** : workflow context, workflow script, SW versions

are stored in **HDF5** files

✓ **Quality data**

✓ **Pipeline data production traceability**



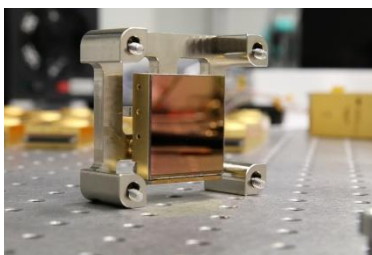
7) Working progress / Open actions

- *Daseit* :
 - Acquisition Robustness
 - Communication issue / Dialog Markury scientific board
- *Dasein* : Develop a deeper Monte-Carlo validation

Further IPNL PA QA actions

- Process approach method to describe the Euclid activities at the IPNL
 - SCS detector integration
- Documentation management procedures
- Contamination management procedures

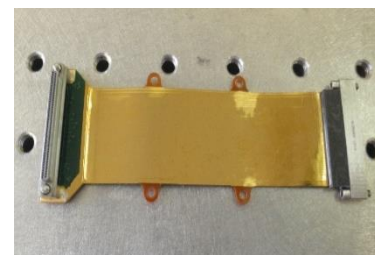
SCS (SENSOR CHIP SYSTEM)



SCA
SENSOR CHIP ASSEMBLY



SCE
SENSOR CHIP ELECTRONIC



CFC
CRYO FLEX CABLE

