



Control of Linac4 from the CCC: status, missing items

J.L. Sanchez Alvarez EIC-PSB

Overview

- CCC
- Applications already available
- Applications still to be prepared
- Summary
- Conclusion

CCC

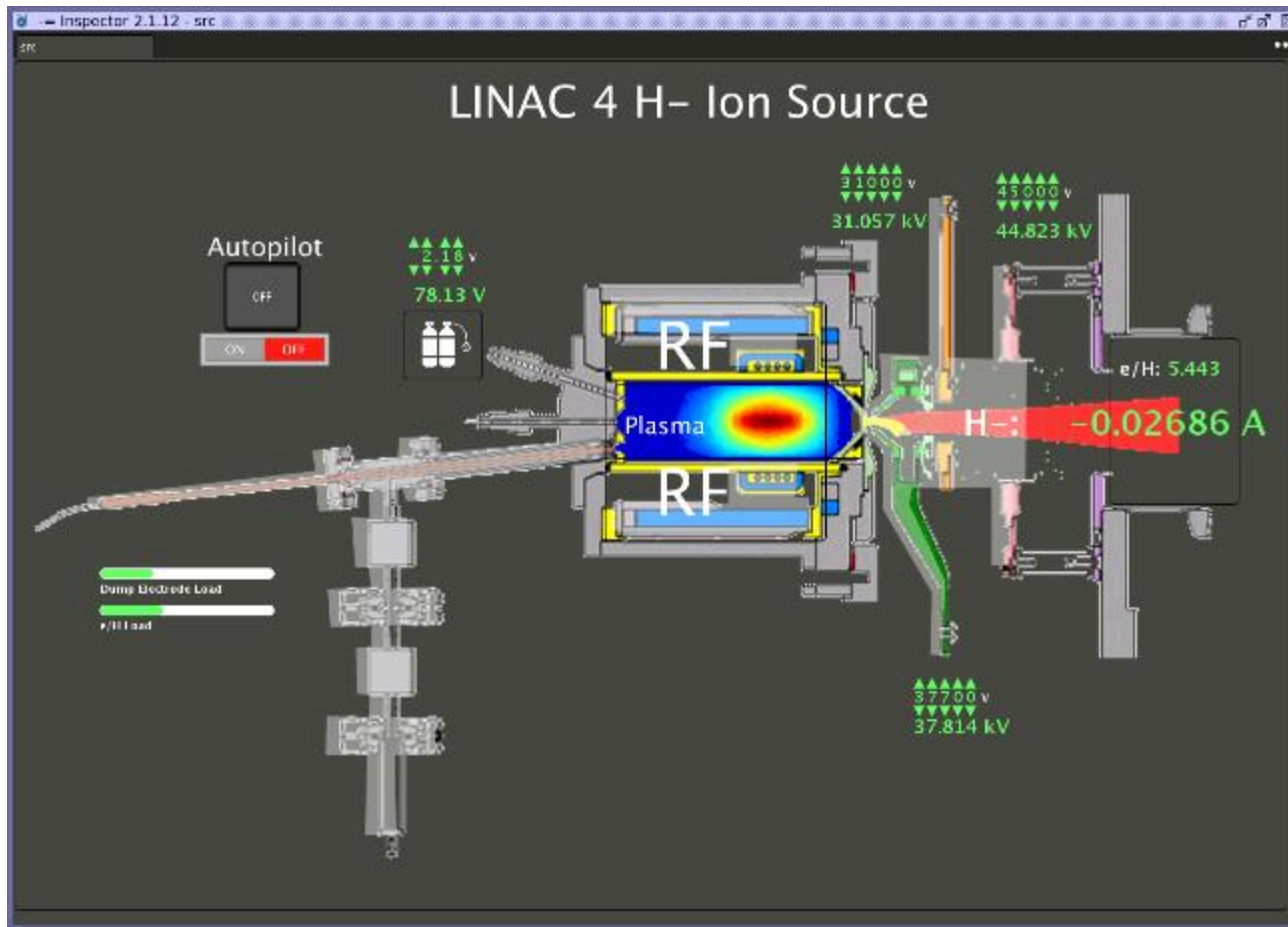


Applications already available

- Generic CO tools
 - Sequence Manager
 - INCA
 - WorkingSet, Knobs, Function editor
 - OASIS
 - LASER / DIAMON
 - Logging System
 - SIS
- Logbook

Applications already available

- Source Autopilot



Applications already available

- Cruise Control

Cruise Control Linac4 v1.1.2 (JavaFX) on LN4.USER.MD5

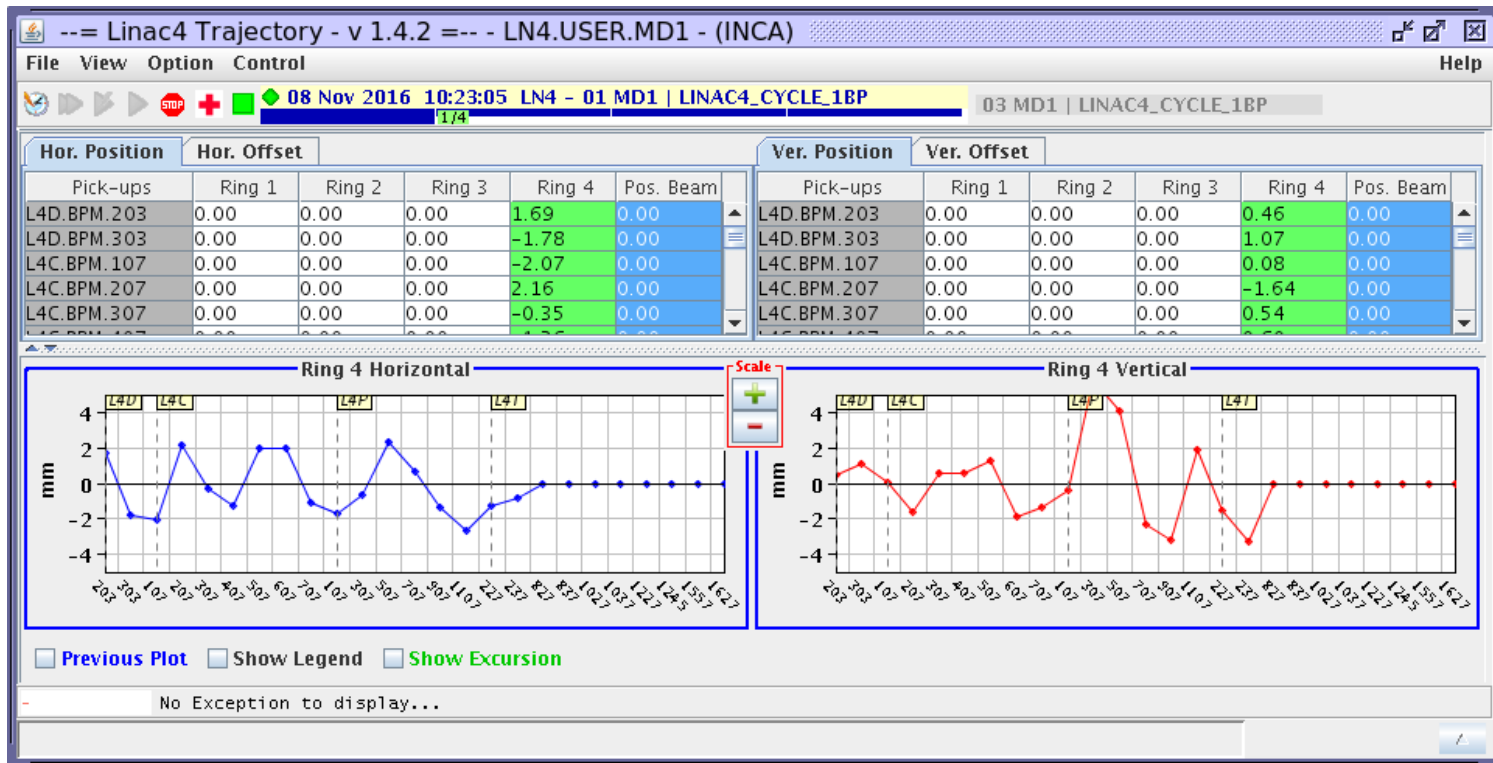
BCTs	RING4	RING3	RING2	RING1	SUM
L4L.BCT.1213	-99.76 E10	-0.00 E10	-0.00 E10	-0.00 E10	-31.92 mA
L4L.BCT.3113	-45.05 E10	-0.00 E10	-0.00 E10	-0.00 E10	-14.29 mA
L4L.BCT.4013	-26.61 E10	-0.00 E10	-0.00 E10	-0.00 E10	-9.06 mA
L4C.BCT.0117	-25.48 E10	-0.00 E10	-0.00 E10	-0.00 E10	-8.38 mA
L4P.BCT.0117	-23.92 E10	-0.00 E10	-0.00 E10	-0.00 E10	-8.39 mA
L4T.BCT.0107	-22.47 E10	-0.00 E10	-0.00 E10	-0.00 E10	-8.38 mA
L4Z.BCT.0273	0.02 E10	0.00 E10	0.00 E10	0.00 E10	0.02 mA
L4T.BCT.0603	-21.33 E10	-0.00 E10	-0.00 E10	-0.00 E10	-8.24 mA
L4H.BCT.1043	-22.02 E10	-0.00 E10	-0.00 E10	-0.00 E10	-8.99 mA
L4H.BCT.1073	14.01 E10	0.00 E10	0.00 E10	0.00 E10	5.85 mA

Num. of turns	5 [us]	0 [us]	0 [us]	0 [us]	0 [us]
Chopper OFF	5000 [ns]	500 [ns]	500 [ns]	500 [ns]	0 [ns]
Chopper ON	100000 [ns]	2000 [ns]	1000 [ns]	500 [ns]	0 [ns]

WDOG L4L: 15/15	WDOG DUMP: 12/12	WDOG HST: 15/15	FREE 1	FREE 2
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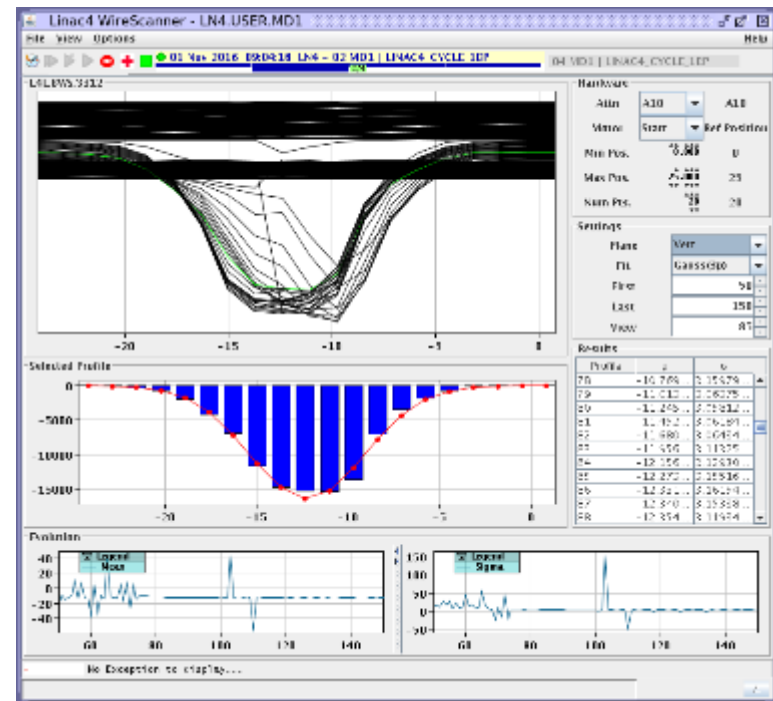
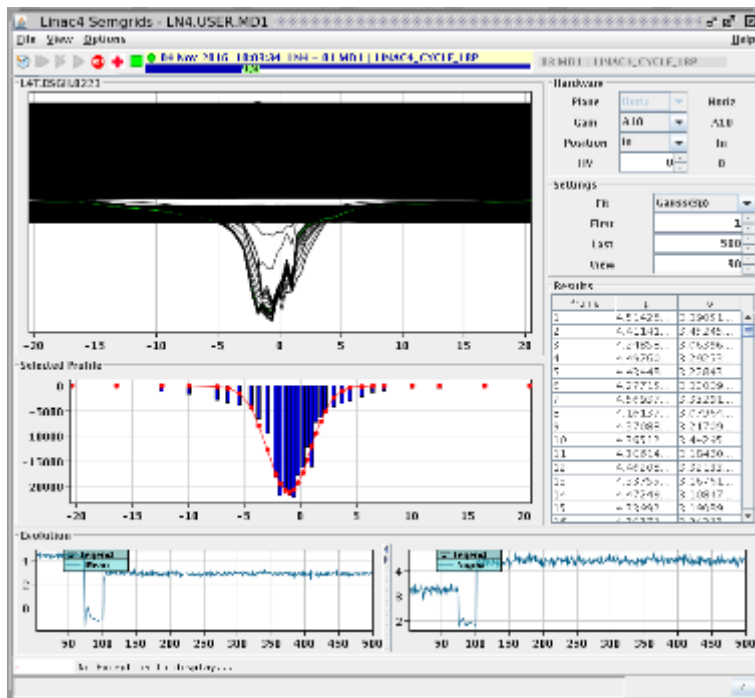
Applications already available

- Trajectory application



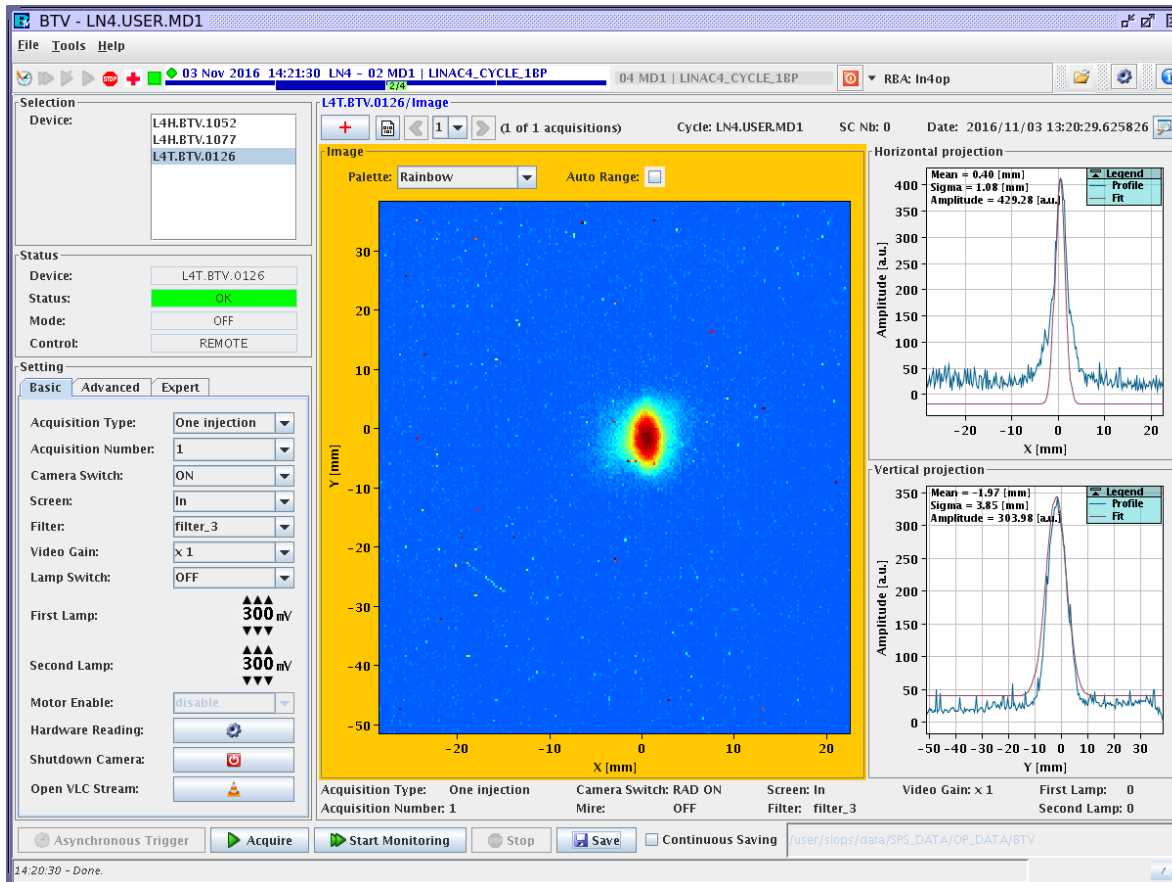
Applications already available

- SEM grids / Wire scanners



Applications already available

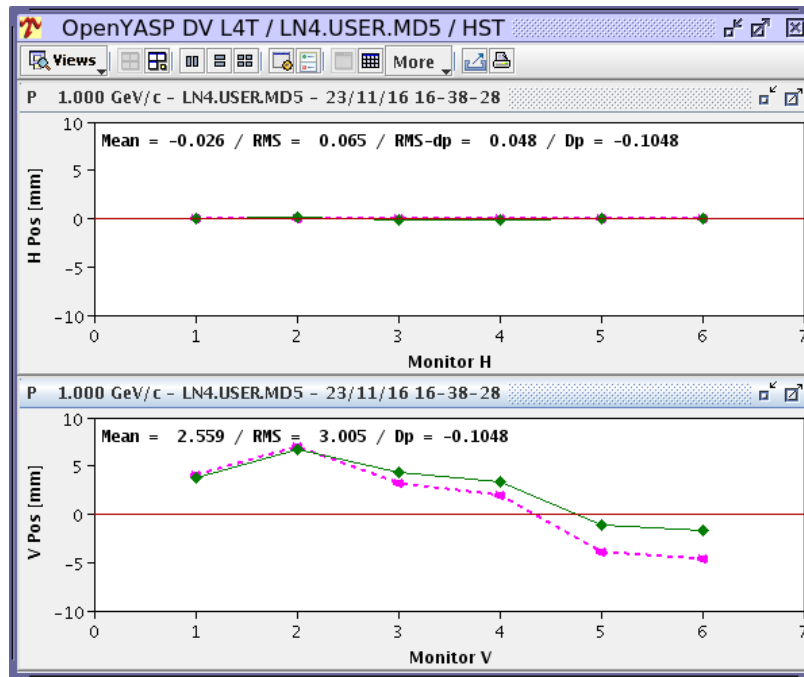
- BTVs



14:20:30 - Done

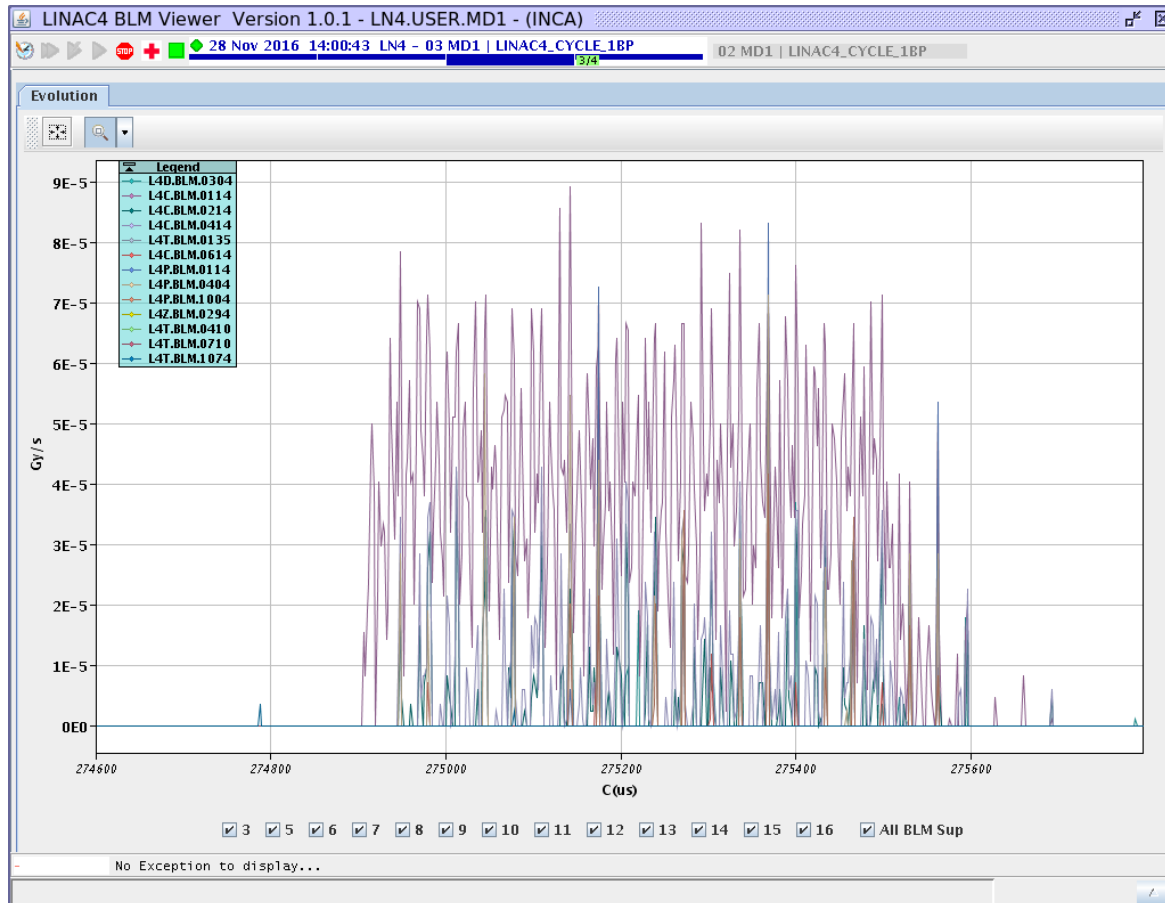
Applications already available

- YASP



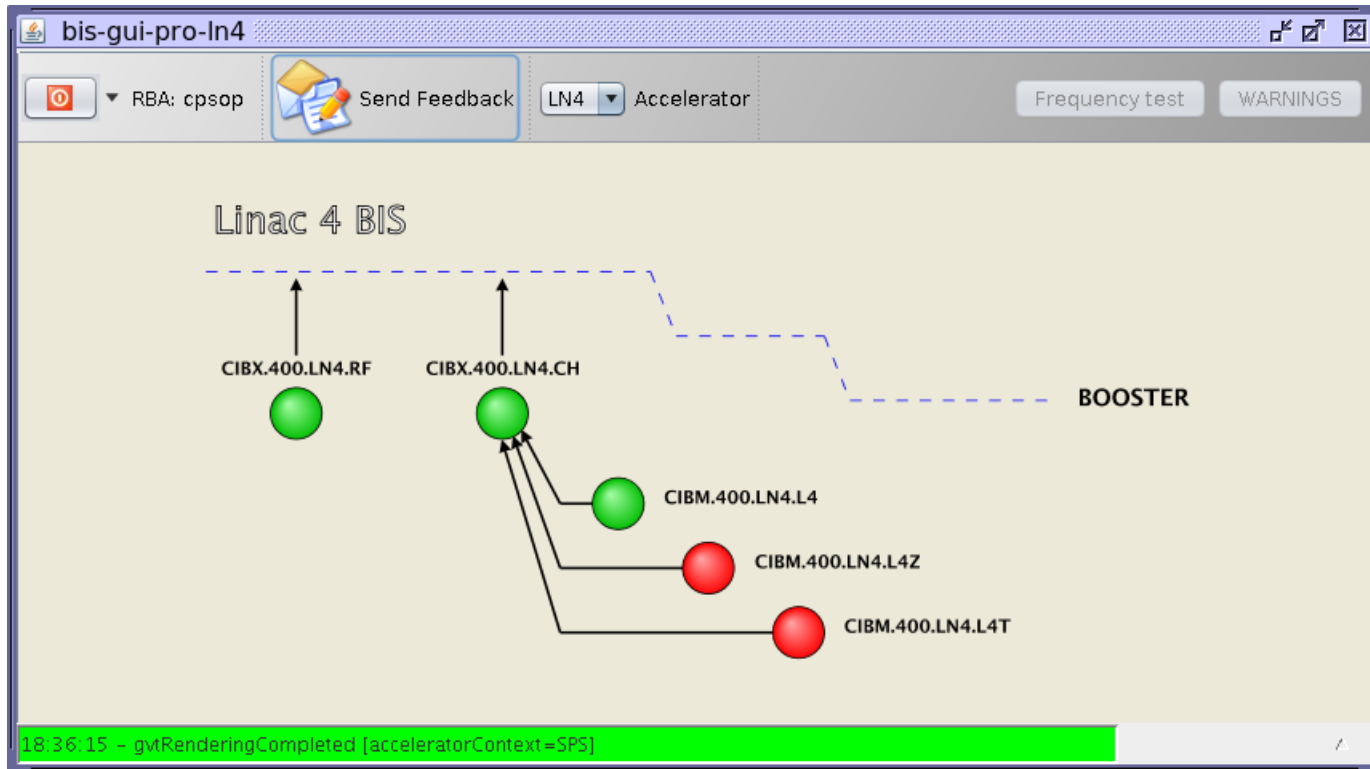
Applications already available

- BLM GUI



Applications already available

- BIS



Applications already available

- WIC

The screenshot shows the WIC LINAC SUPERVISION v0.0.9 interface. At the top, it displays 'LINAC WIC LINAC SUPERVISION v0.0.9'. Below this, there is a 'LINAC 4' section with a schematic diagram of the LINAC 4 structure. The diagram includes labels for LINAC 4 and various components like LINAC 4.1, LINAC 4.2, LINAC 4.3, LINAC 4.4, LINAC 4.5, LINAC 4.6, LINAC 4.7, LINAC 4.8, LINAC 4.9, LINAC 4.10, LINAC 4.11, LINAC 4.12, LINAC 4.13, LINAC 4.14, LINAC 4.15, LINAC 4.16, LINAC 4.17, LINAC 4.18, LINAC 4.19, LINAC 4.20, LINAC 4.21, LINAC 4.22, LINAC 4.23, LINAC 4.24, LINAC 4.25, LINAC 4.26, LINAC 4.27, LINAC 4.28, LINAC 4.29, LINAC 4.30, LINAC 4.31, LINAC 4.32, LINAC 4.33, LINAC 4.34, LINAC 4.35, LINAC 4.36, LINAC 4.37, LINAC 4.38, LINAC 4.39, LINAC 4.40, LINAC 4.41, LINAC 4.42, LINAC 4.43, LINAC 4.44, LINAC 4.45, LINAC 4.46, LINAC 4.47, LINAC 4.48, LINAC 4.49, LINAC 4.50, LINAC 4.51, LINAC 4.52, LINAC 4.53, LINAC 4.54, LINAC 4.55, LINAC 4.56, LINAC 4.57, LINAC 4.58, LINAC 4.59, LINAC 4.60, LINAC 4.61, LINAC 4.62, LINAC 4.63, LINAC 4.64, LINAC 4.65, LINAC 4.66, LINAC 4.67, LINAC 4.68, LINAC 4.69, LINAC 4.70, LINAC 4.71, LINAC 4.72, LINAC 4.73, LINAC 4.74, LINAC 4.75, LINAC 4.76, LINAC 4.77, LINAC 4.78, LINAC 4.79, LINAC 4.80, LINAC 4.81, LINAC 4.82, LINAC 4.83, LINAC 4.84, LINAC 4.85, LINAC 4.86, LINAC 4.87, LINAC 4.88, LINAC 4.89, LINAC 4.90, LINAC 4.91, LINAC 4.92, LINAC 4.93, LINAC 4.94, LINAC 4.95, LINAC 4.96, LINAC 4.97, LINAC 4.98, LINAC 4.99, LINAC 4.100. The interface also features several green status indicators and a 'LINAC 4' label. At the bottom, there are fields for 'LINAC 4 LAMP' and 'RESTART'.

The screenshot shows two monitoring interfaces: CIP IO Status and CIWRA Status. Both interfaces are connected to 'CFP_400_CIWTLINAC4 DATA Connection OK'.

CIP IO Status (CIW.400.TL.1):
 Monitoring: ST_SUPPLY_24V_1 (green), ST_SUPPLY_24V_2 (green), User_Permit_A to BIS (green), PASS_OUT (green), CONFIGURATION DATA (green), User_Permit_B to BIS (green), ACK_REQ (white).
 POWER CONVERTERS: A large table of data points for various power converters, with columns labeled L4 T and rows containing numerical values and status indicators.

CIWRA Status (CIWRA.400.TL.1):
 Monitoring: ST_SUPPLY_24V_1 (green), ST_SUPPLY_24V_2 (green), CRATE STATUS (green), PASS_OUT (green), ACK_REQ (white).
 MAGNETS: A large table of data points for various magnets, with columns labeled L4 T and rows containing numerical values and status indicators.

PLC Inputs:
 Magnet Coil Temp: A row of green status indicators.
 Water Pressure: A row of green status indicators.
 Water Temp: A row of green status indicators.
 Emergency Stop: A row of green status indicators.

At the bottom right, there are buttons for 'CIW', 'ACK-PASS', 'FULL TEST (Coil, water, stop)', 'CMD_RESET', and 'Sel'.



Applications still to be prepared

- Synoptics of Linac4 and transfer lines
- Fixdisplays Linac4
 - Source and RF status, BCTs, BLMs, stripping foil status
 - Linac4 machine and transfer line
- Linac4 RF
 - bunchers, RFQ, DTL (3 modules), CCDTL (7 modules), PIMS (12 modules), debuncher
 - A mixture of FESA 2 and FESA 3.
 - Many parameters not yet incaified. No standard PPM copy currently possible.
 - The knobs and working sets are not yet defined.
 - If special application required, specifications needed from RF team.
- Time of Flight
 - ToF to be calculated within FESA class
- Bunch shape measurement
 - Important to obtain energy spread. Application in progress.
- Transverse emittance measurement application
 - Emittance measurement in L4Z line (Linac4 dump line) using 3 Semgrids and taking into account space charge (algorithm needed from ABP)

Summary

- A large amount of applications are available to control and qualify the beam.
- Fixdisplays will show an overview of the LINAC4 status. The operator will be informed quickly when something wrong happened.
- The logging system will help to do the post-mortem of the fault.
- The RF control needs clarifications.
- To better qualify the beam, some efforts are needed to improve the measurement of the energy, energy spread and the emittance.
- The elogbook will be one of the main tools for the reliability run. Faults, measurements etc. should be described in detail in the elogbook.

Conclusion

- Operation of the Linac4 from the ccc will be possible, but needs to be carefully prepared. The first week(s) might be needed to solve basic issues like RBAC, cleaning up LASER alarms etc. and should not be counted into the reliability period.
- Operators will be available to survey Linac4 during the reliability run, but priority is Linac2 and PSB operation.
- Need clarification of operational mode (simply survey and reaction to faults, or periodic change of settings, type and frequency of measurements etc.). What is the reaction to faults? (piquet coverage or not, nights/weekends?)

Spare

