SOLARIS
NATIONAL SYNCHROTRON
RADIATION CENTRE

JAGIELLONIAN UNIVERSITY
IN KRAKOW

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RADIATION CENTRE

Solaris status

Piotr Goryl,
on behalf of CSiIT group and all the Solaris team

Kraków, 20.05.2015

Outline

- About the project
- Peaople and collaboration
- Tools
- Summary

The Project

Overview

Solaris is a replica of the MAX IV 1.5 GeV Storage Ring and parts of the injection system being concurrently built in Sweden.

First electrons - December, 19th, 2014

First light - June 2015

Firs users – March 2016

Agreement established between Jagiellonian and Lund Universities for mutual cooperation in the construction of Solaris based on MAX IV.

Solaris team was hosted at MAX-lab and participate in project activities and training.

Sharing of mutual resources.

Procurements for Solaris are as options in MAX IV tenders.

MAX IV

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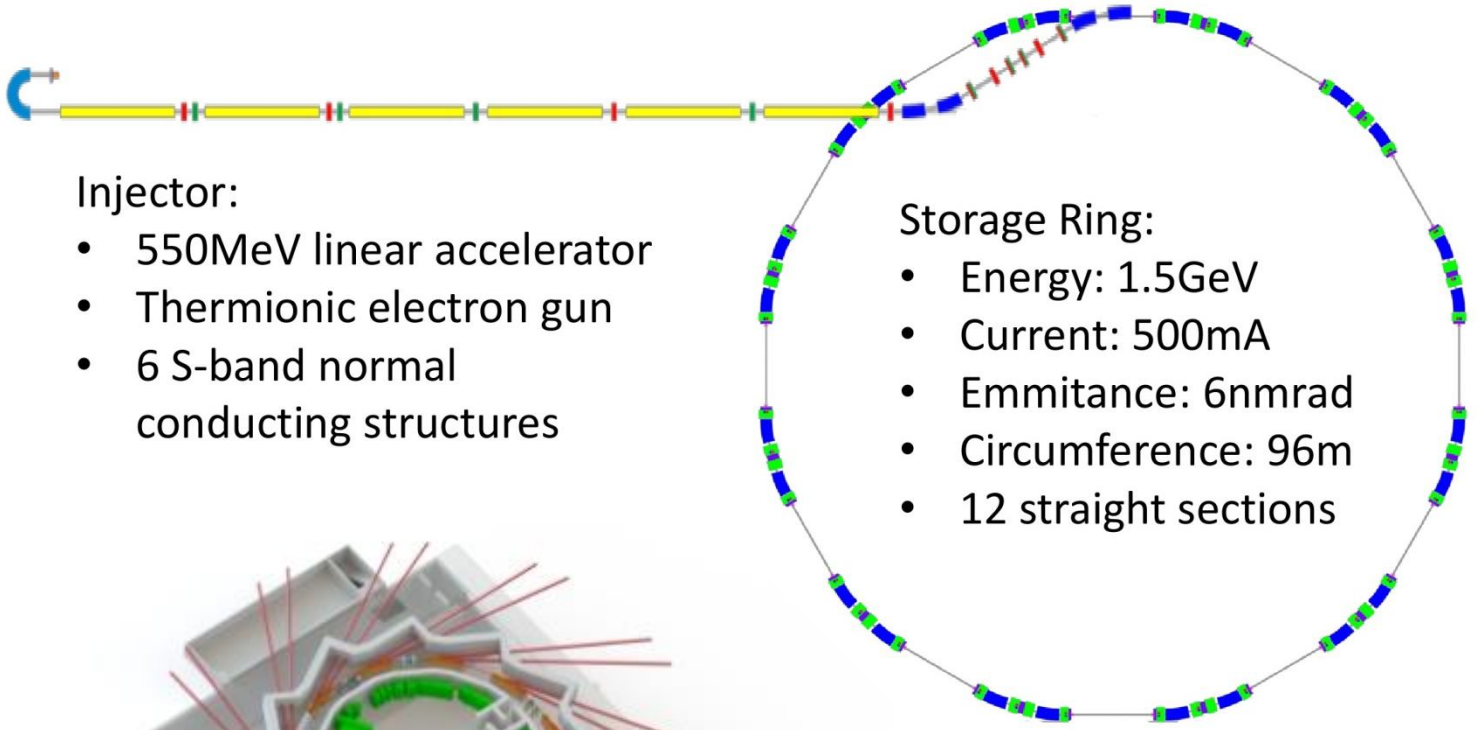
The Machine

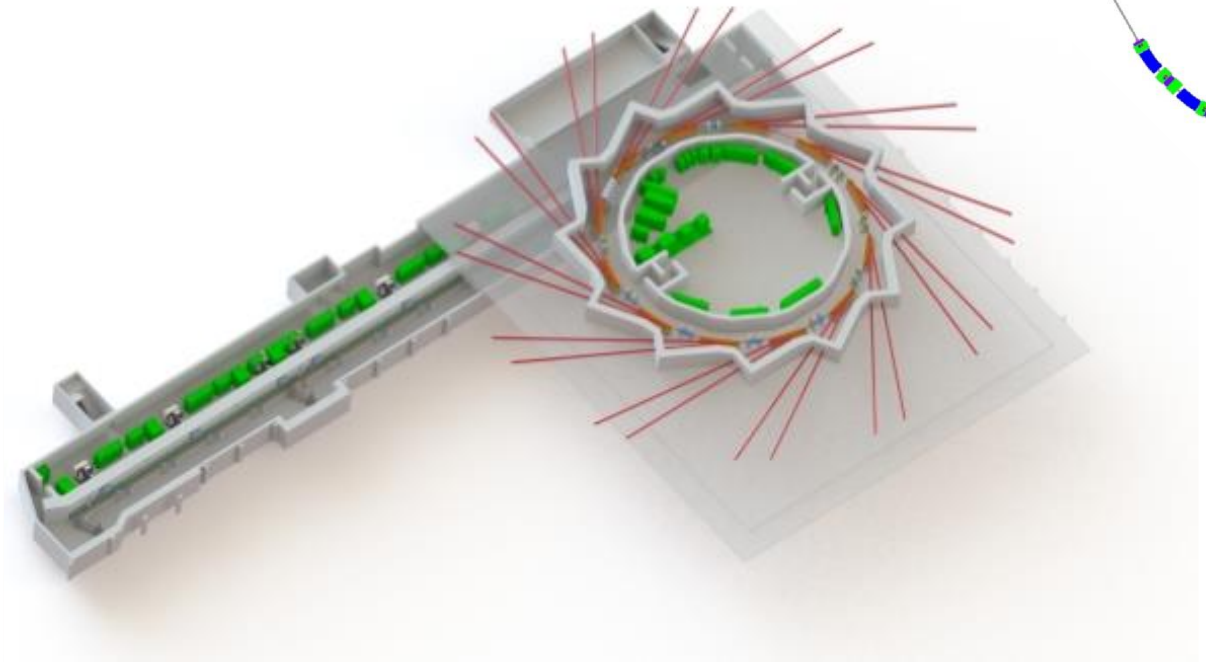


Injector:

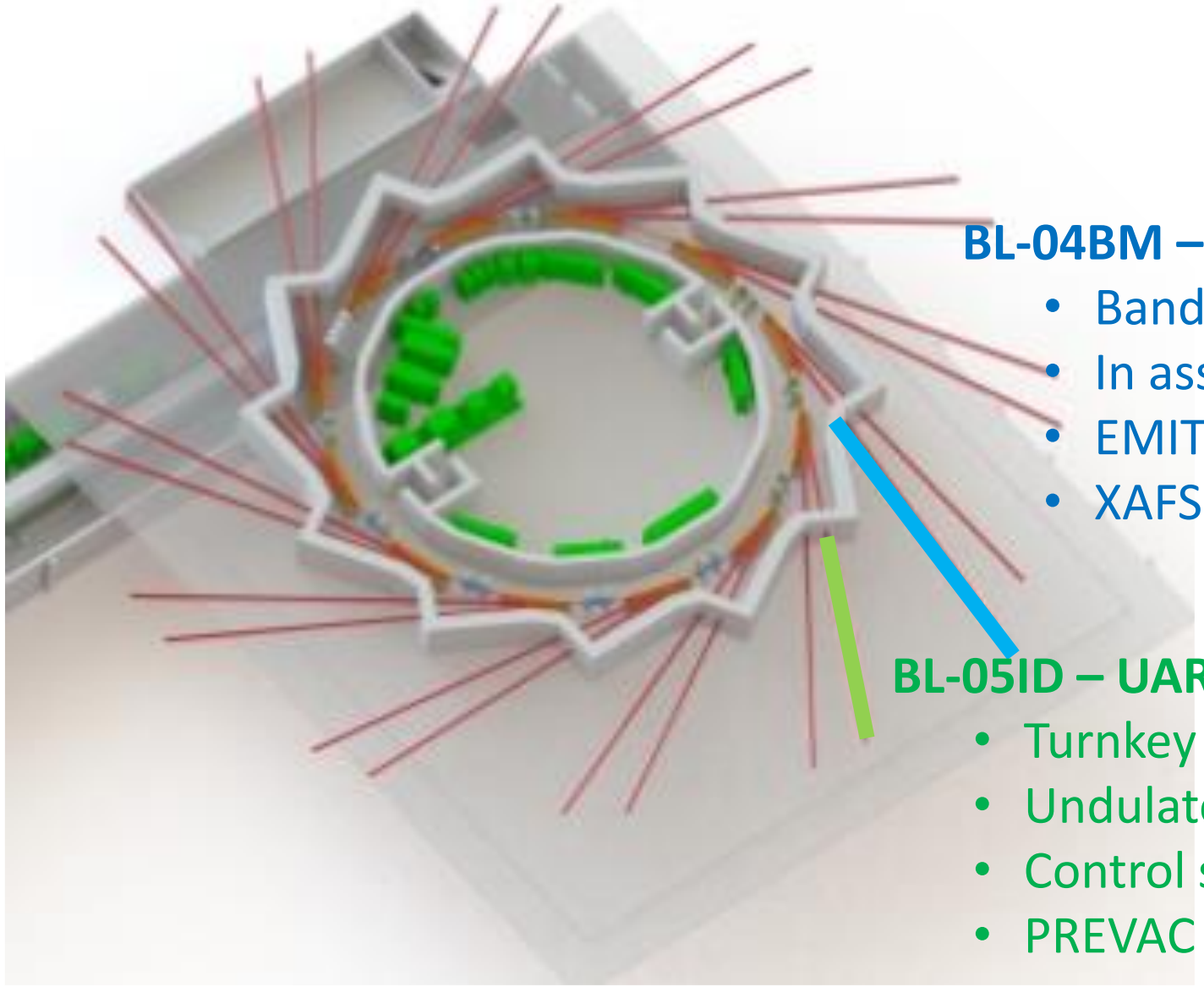
- 550MeV linear accelerator
- Thermionic electron gun
- 6 S-band normal conducting structures

Storage Ring:

- Energy: 1.5GeV
- Current: 500mA
- Emmitance: 6nmrad
- Circumference: 96m
- 12 straight sections



Beamlines



BL-04BM – PEEM

- Banding magnet based
- In assembly
- EMITEC end-station
- XAFS endstation

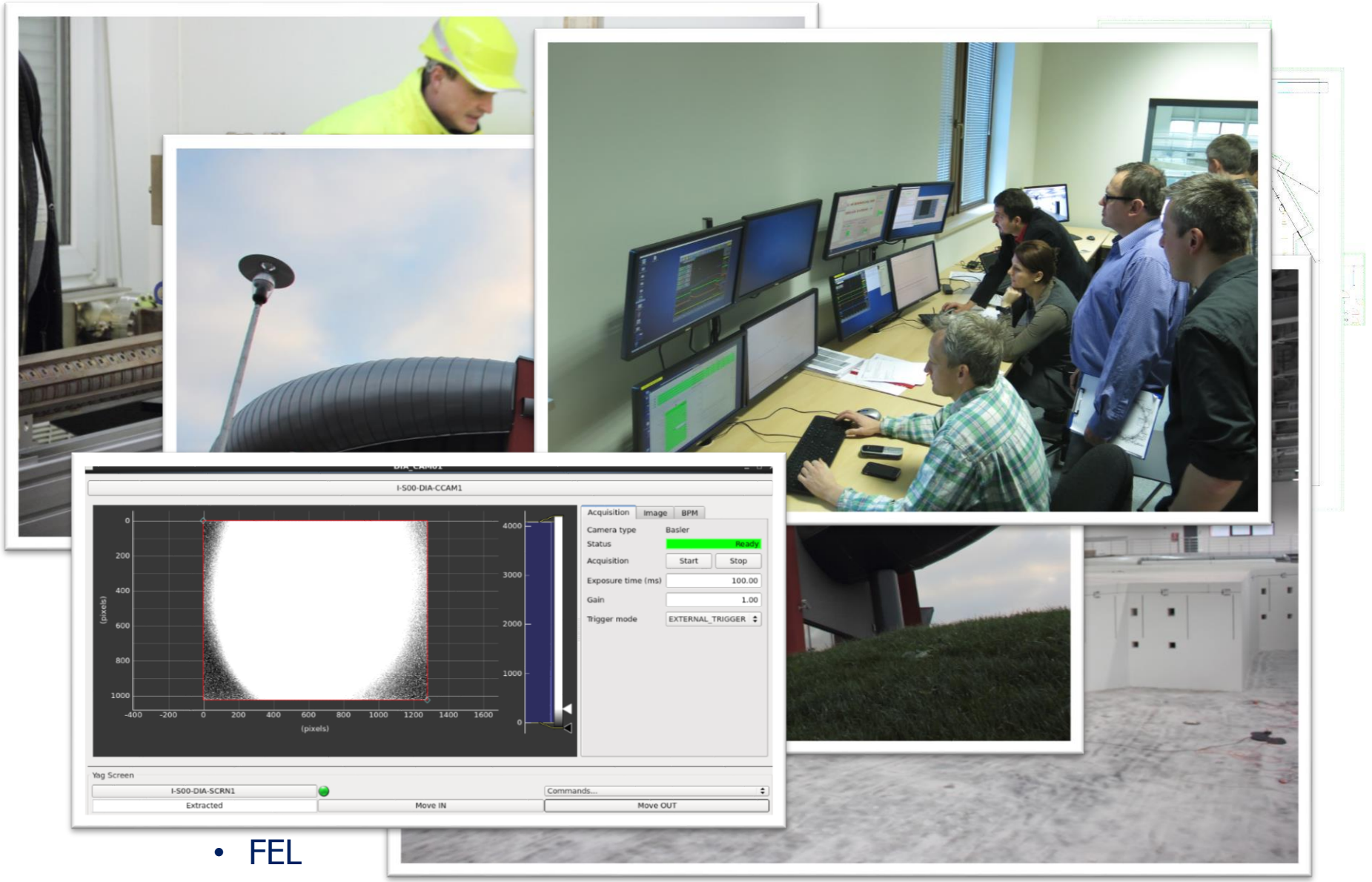
BL-05ID – UARPES

- Turnkey delivery by Elettra
- Undulator ID
- Control system commissioning (Cosylab)
- PREVAC end-station

Previous Meetings

Previous Meetings

Now


I-S00-DIA-CCAM1
Acquisition
Image
BPM
Camera type
Basler
Status
Ready
Acquisition
Start
Stop
Exposure time (ms)
100.00
Gain
1.00
Trigger mode
EXTERNAL_TRIGGER
(pixels)
(pixels)
Yag Screen
I-S00-DIA-SCRN1
Extracted
Move IN
Commands...
Move OUT

- FEL

Solaris people involved in the CS related work

- **Krzysztof, Piotr Ga.**
  - Machine ProtectionSystem
  - Personal Safety System
- **Michal, Piotr K.**
  - IT infrastructure and services
  - Help-desk
- **Lukasz Z., Lukasz D., Wojtek**
  - Control system software
  - Outsourced Tango and students software development coordination
  - Motion control
- **Julia** (PhD. Student in IT, 30% of time)
  - General software development
  - Database applications
  - Students' projects coordination
- **Ada, Arek, Maciek (diagnostic group)**
  - High level software
  - Diagnostic instrumentation
- **Tadeusz** (hired within the PL-Grid Plus project)
  - SynchroGrid coordination
  - HPC services
- **Piotr Go.**
  - Coordination
  - Virtual accelerator

- **Students:** non-critical tasks, GUIs, helper tools,

Tasks outsourced to:

- **MAX-IV**
  - Requirements gathering
  - General expertise, training
  - System design
  - Device servers and part of physics scripts development
- **Elettra**
  - Expert support
  - PSS concept and software development
  - Ramping software development
- **Cosylab**
  - Control system integration
  - GUI and supplementary tango software development
  - Timing system design and delivery
- **Installation company** (ZSK)
  - PLC systems executive design, fabrication and installation
  - Signals and IT cabling

Outsourcing minimized risk related to lack of expertise

by moving it to operation period due to small team!

In mitigation with documentation provided by the Cosylab and students involvements

Collaboration

MAX-IV (Lund, Sweden) –Collaboration agreement

- design of the machine
- tendering and purchasing
- development

ELETTRA (Trieste, Italy) – The Expertise Service Contract

- Personal Safety System
- Energy ramping
- Various reports

ALBA (Barcelona, Spain) – MoU

- vacuum systems

PSI (Villigen, Switzerland) - MoU

- RF systems
- Experimental Beamiline

CERIC initiative – Central European Research Infrastructure Consortium

PL-Grid – HPC support, strorage services

TANGO Collaboration

Tools

IT and Control Systems

Overview | Activity | Roadmap | Issues | New issue | Gantt | Plan | News | Wiki | Contacts

Overview

This project cover all issues regarding to control system and IT for Solaris synchrotron facility during its project phase. It will be divided into sub-projects.

- Subprojects: Beamline Control, Digital User Office, General and Office systems, IT infrastructure, Machine Control, SynchroGrid

Issue tracking

- Bug: 15 open / 197
- Feature: 94 open / 427
- Support: 5 open / 152
- Tasks: 110 open / 1506
- Milestone: 0 open / 6
- TaskGroup: 70 open / 145
- Incoming: 4 open / 12

View all issues | Gantt

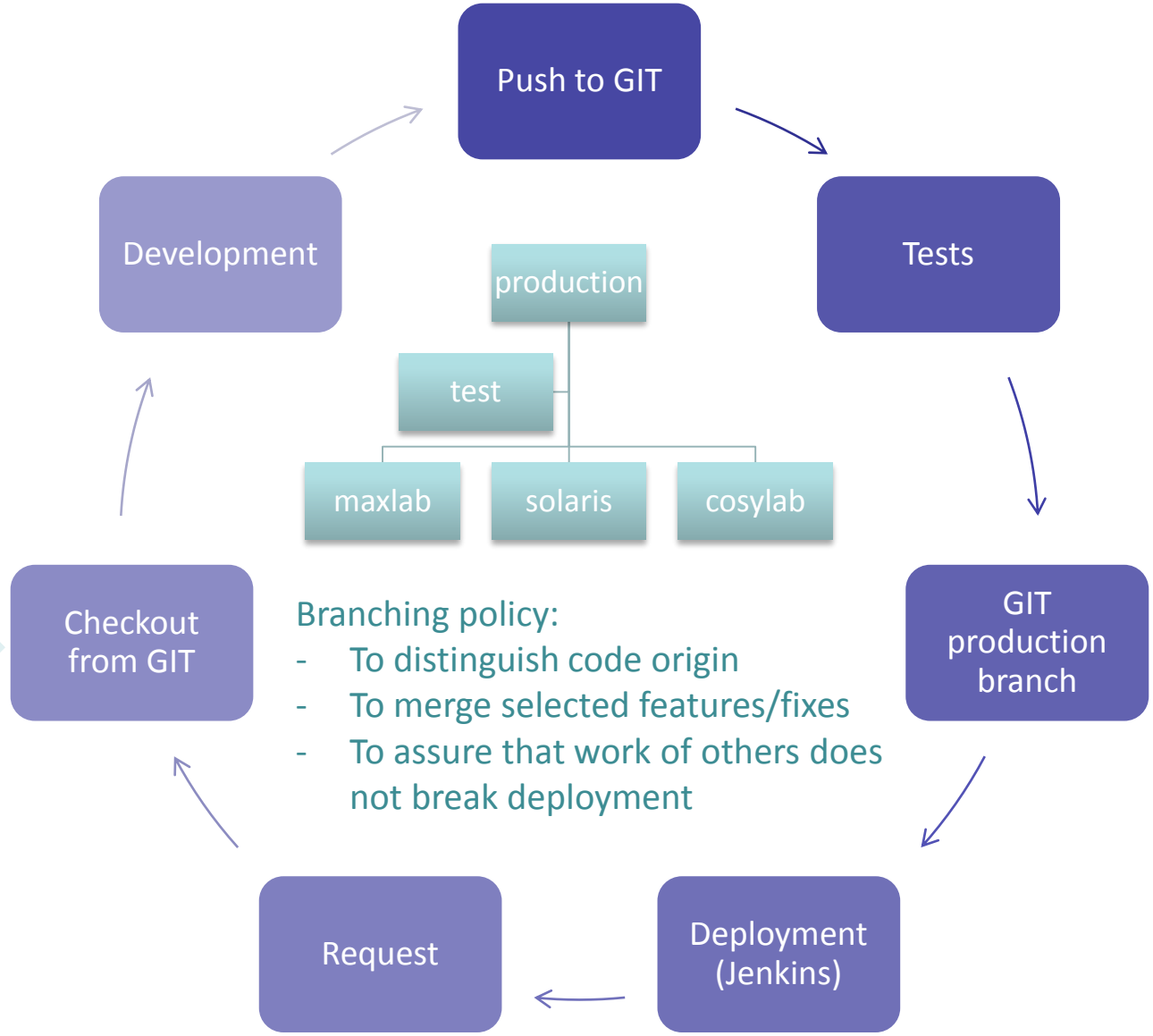
we use RedmineCRM
plugins and themes for Redmine

Workflow

Jenkins (automated deployment)

GITORIOUS

GIT (code versioning repository)



Branching policy:

- To distinguish code origin
- To merge selected features/fixes
- To assure that work of others does not break deployment

Software – Cosylab deliveries

Packages included in base contract and extension

•Defined list of device server packages (Low level)

- Tango base software packages including historical, temporary and snapshot archiving
- Get – Test – Delivery – Deploy – Start
- Development: Danfysik power supplies, RF transmitters, Pulsed power supplies, diagnostic difference between UARPES and PEEM beamline

•Control room applications

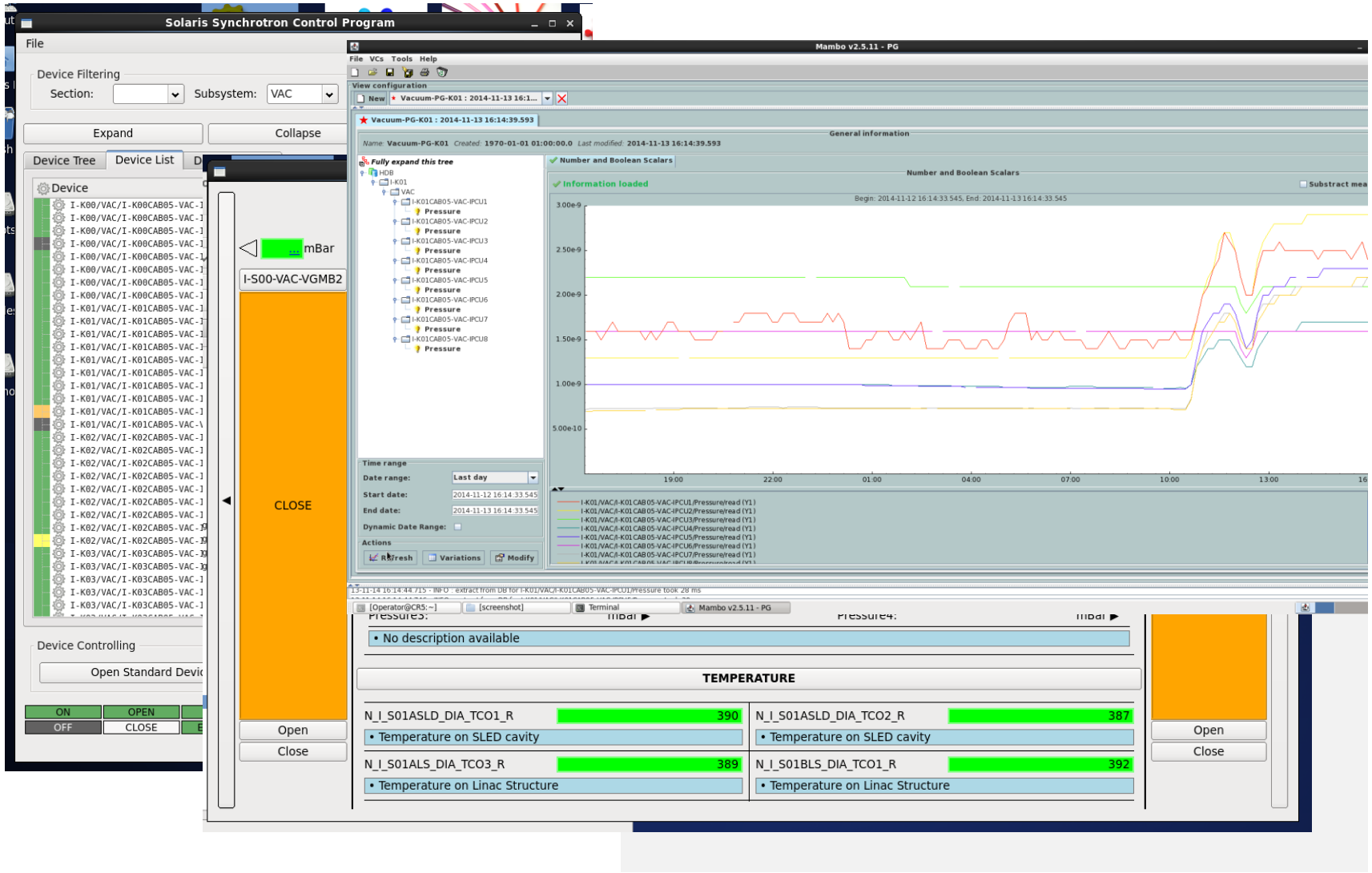
- Engineering screens
- Menu to access
- Other GUIs within an agile package

•Agile work (defined as men-weeks available)

- On-site support (120 man-days)
  - Additional manpower for day to day work
  - Solving issues efficiently
  - Direct contact with our team
- Off-site support (110 man-days)
  - Work not defined in packages
  - Adopting MAX-IV changes
- Covers HLS physics and not well defined work

- **Status**
  - Machine integrated.
  - Agile 130 men-days has been almost fully used
  - **We are taking responsibility for handling the software**
  - Beamlines upon integration
  - MML in preparation

Software


Solaris Synchrotron Control Program
File
Device Filtering
Section:
Subsystem:
VAC
Expand
Collapse
Device Tree
Device List
Device
Device Controlling
Open Standard Devic
ON
OPEN
OFF
CLOSE
mBar
I-S00-VAC-VGMB2
CLOSE
Open
Close
Mambo v2.5.11 - PG
File VCs Tools Help
View configuration
General information
Number and Boolean Scalars
Information loaded
Time range
Date range:
Last day
Start date:
End date:
Dynamic Date Range:
Actions
Refresh
Variations
Modify
• No description available
TEMPERATURE
N_I_S01ASLD_DIA_TCO1_R
390
• Temperature on SLED cavity
N_I_S01ASLD_DIA_TCO2_R
387
• Temperature on SLED cavity
N_I_S01ALS_DIA_TCO3_R
389
• Temperature on Linac Structure
N_I_S01BLS_DIA_TCO1_R
392
• Temperature on Linac Structure
Open
Close

Status summary

We are in commissioning stage

- Working to inject and make first turn ☺ in couple of weeks
- Some integrated system test are on going

99% of the machine is integrated

- RF system integration is in progress

Beamlines are upon integration

Preparations for users

Tango Community tools we use

- Tango 8.1.2
- Taurus
- HDB/TDB/SNAP/Bensikin/Mambo
- Sardana for beamlines
- JDDD – deployment in progress
- Device servers
- ….

Challenges

- Network infrastructure procured in times of low budget
- Small team
- Some technical issues: 100%CPUS, timeouts in PLCs, shortcuts of pole-face strips in the integrated mahnets
- Difficulties to judge importance of issues

Future

- Operation through CERIC
- Stage II – waiting for a call
- Projects establishing
  - New features in the current system
  - Mobile/Web Tango
  - Building Management System – Machine PLC system integration
  - …

Thank You

www.synchrotron.pl

TANGO

PL GRID

MAX IV

Special credits to Darren Spruce and the whole MAX-IV KITS group

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ROZWOJU REGIONALNEGO

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