

HERA transverse polarimeter

Online DAQ: status report

- Overview
- Performance and first tests
- User interface
 - Monitor
 - Run control, Auto-pilot

Overview

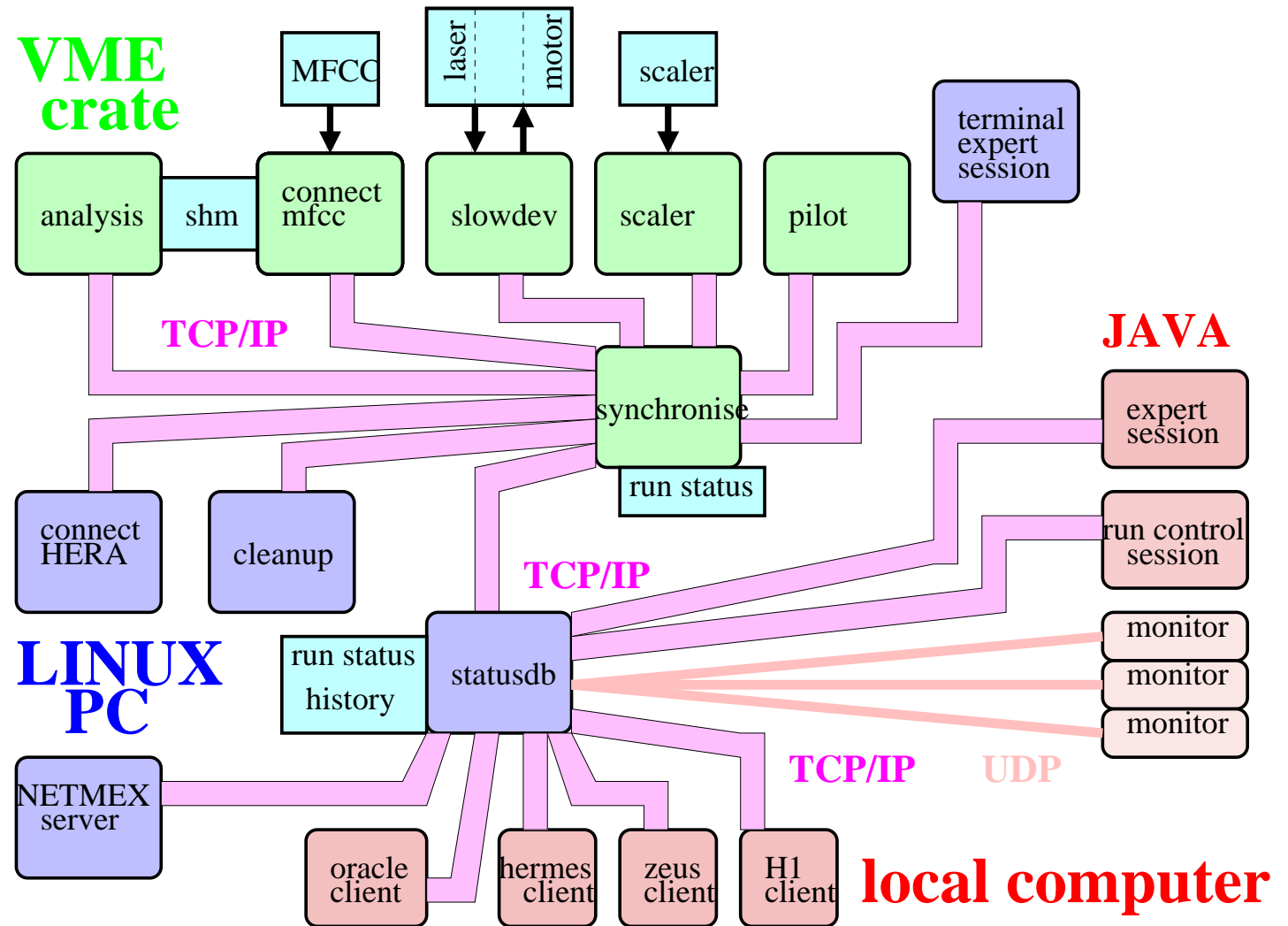
General

- All subcomponents can be controlled remotely
- DAQ programs are connected by TCP/IP sockets
- Monitoring tasks are connected by UDP sockets

Interface

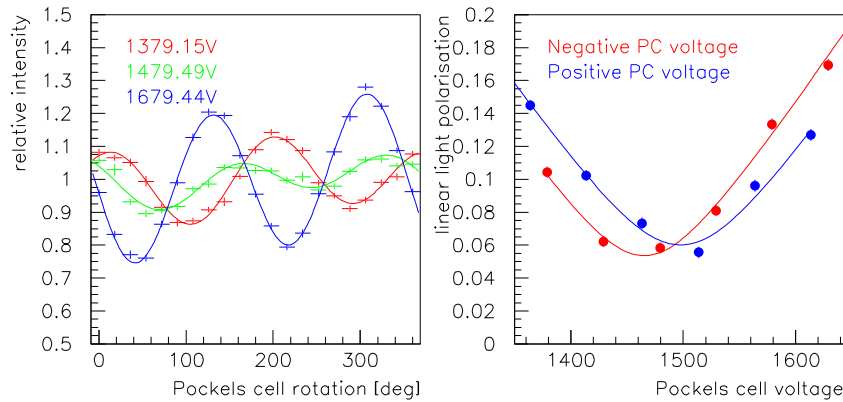
- Java based interface for online monitoring and run-control
- Terminal based interface for “real” experts
- Small online database for most recent history (10 hours), used by the java-tool
- Everything is logged to ORACLE for offline access
- Dedicated clients for the experiments
- NETMEX server

Schematic overview



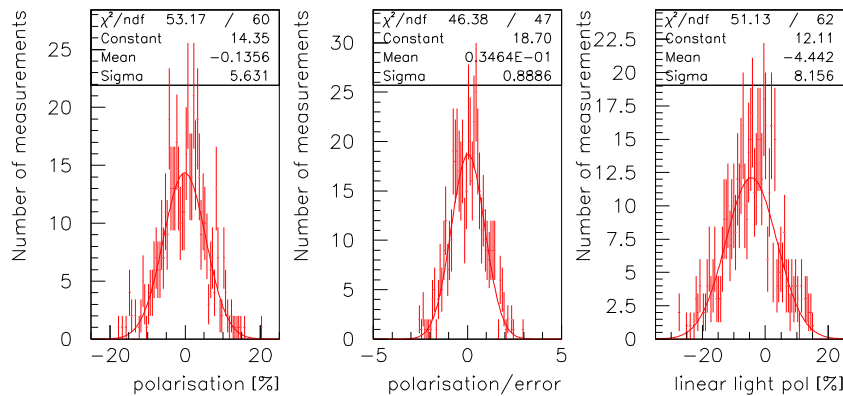
Performance and first tests

- Light polarisation measurements



Slow controls and algorithms work fine

- Tests with low currents in December 2001:
online analysis results



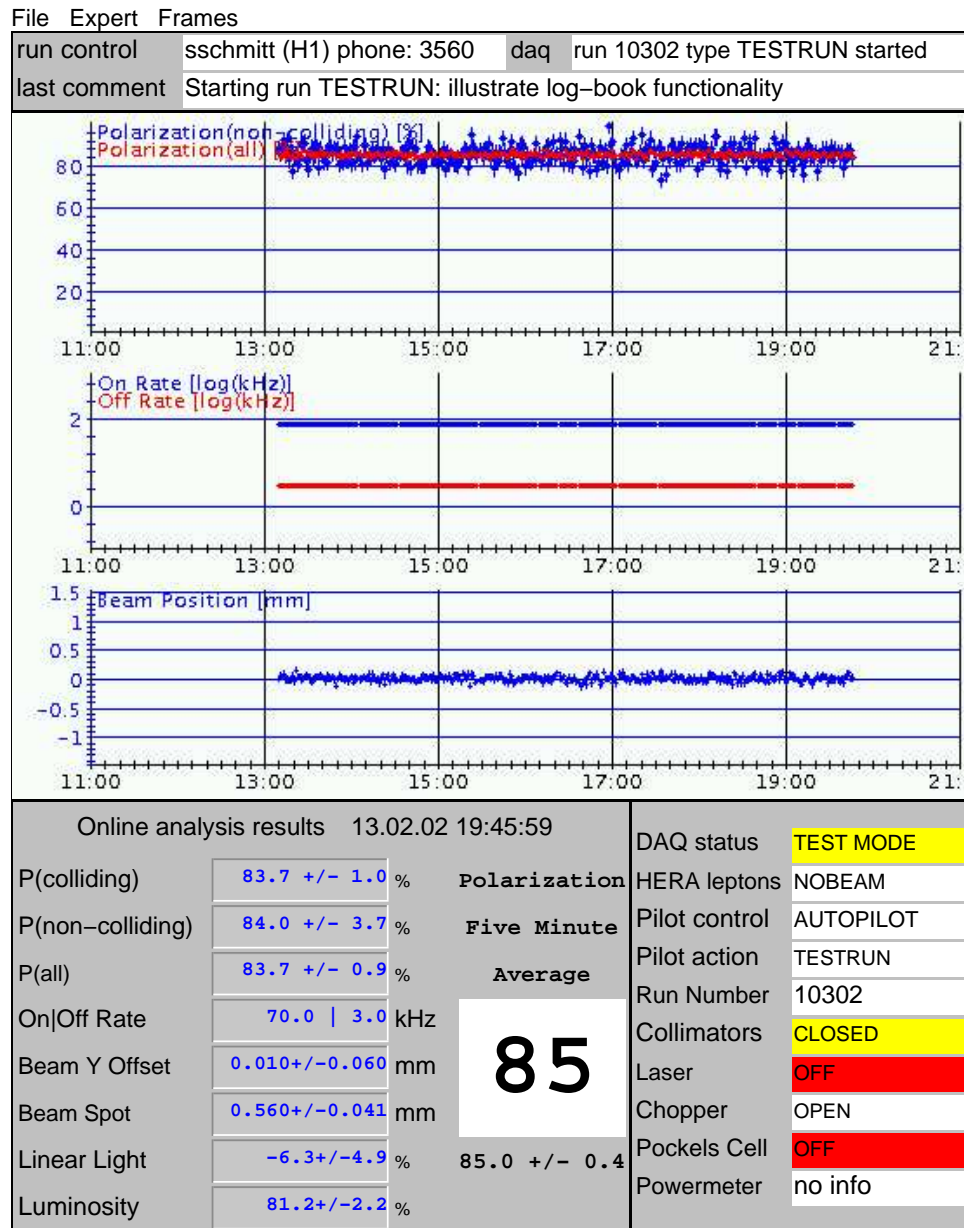
Polarisation is zero \rightarrow no bias

Light polarisation \approx direct measurement

- High rate LED tests: 45 KHz and 90 KHz
 \rightarrow deadtime negligible

User interface: TPOL monitor

- Written in java → can run on Linux and NT
- See <http://pctpol03.desy.de> for instructions



TPOL monitor (continued)

- Program is still improving — update Your copy frequently
- Display and print-jobs can be configured, settings can be saved for the next session

File

Set time scale

time window	labels	ticks
<input checked="" type="radio"/> 10.0 h	<input type="radio"/> 10.0 h	<input type="radio"/> 1.0 h
<input type="radio"/> 5.0 h	<input type="radio"/> 5.0 h	<input type="radio"/> 30.0 min
<input type="radio"/> 2.0 h	<input checked="" type="radio"/> 2.0 h	<input checked="" type="radio"/> 10.0 min
<input type="radio"/> 1.0 h	<input type="radio"/> 1.0 h	<input type="radio"/> 5.0 min

Choose variables

☒ P(all) ☒ P(ncoll) ☐ P(coll) ☐ P(LPOL)

☒ show rates ☐ show LPOL/TPOL ratio

Change symbol for Beam Position

<input type="radio"/> circ	<input type="radio"/> rect	<input type="radio"/> hline	<input checked="" type="radio"/> dot	<input type="radio"/> box	<input type="radio"/> cross
<input checked="" type="radio"/> tiny	<input type="radio"/> small	<input type="radio"/> large			

- Electronic log-book to browse recent comments and error messages

File

TPOL DAQ Messages

<input checked="" type="checkbox"/> level	SUCC 13.02.02 19:30:25/1 [Statusdb] connected to Control@pctpol01.desy.de:1939
<input checked="" type="checkbox"/> date	OPER 13.02.02 19:30:26/1 [Pilot] Run control taken by sschmitt (H1) phone: 3560
<input checked="" type="checkbox"/> time	OPER 13.02.02 19:30:55/1 [Pilot] move FSM pockelcell from SETHV to OFF
<input checked="" type="checkbox"/> from	OPER 13.02.02 19:30:57/1 [Pilot] move FSM calohv from UNDEFINED to OFF
<input checked="" type="checkbox"/> at	OPER 13.02.02 19:30:59/1 [Pilot] move FSM fiberhv from UNDEFINED to OFF
<input checked="" type="checkbox"/> OPER	SUCC 13.02.02 19:30:59/2 [Slowdev] start CAN transfer, DAC values 0 0 0 0
<input checked="" type="checkbox"/> SUCC	OPER 13.02.02 19:31:04/1 [Pilot] move FSM control from OPERATOR to AUTOPILOT
<input checked="" type="checkbox"/> WARN	WARN 13.02.02 19:32:16/1 [Statusdb] remove client UDP@pctpol01.desy.de:1063
<input checked="" type="checkbox"/> MESSG	SUCC 13.02.02 19:39:29/1 [Statusdb] connected to Super@pctpol03.desy.de:1484
	WARN 13.02.02 19:39:47/1 [Statusdb] connection to Super@pctpol03.desy.de:1484 lost
	SUCC 13.02.02 19:39:49/1 [Statusdb] connected to Super@pctpol03.desy.de:1485
	OPER 13.02.02 19:45:07/1 [Pilot] Test entry to the log-book
	OPER 13.02.02 19:45:49/1 [Pilot] Starting run TESTRUN: illustrate log-book functionality
	MESG 13.02.02 19:45:49/2 [Pilot] run 10302 type TESTRUN started
	OPER 13.02.02 19:45:49/3 [Pilot] move FSM pilot from IDLE to TESTRUN

Run control, Auto-pilot

- The run control (RC) consists of **finite state machines** (FSM), represented as buttons with colors, e.g **Chopper**

OPEN→CLOSING→CLOSED→OPENING→

File					
Session type <input type="radio"/> not connected <input type="radio"/> monitor <input checked="" type="radio"/> control <input type="radio"/> expert					
Global DAQ status: UP					
Pilot control	Pilot status	Laser	Collimators	horizontal coll.	vertical coll.
AUTOPILOT	IDLE	OFF	CLOSED	CLOSED	DISABLED
Lightpol control	Lightpol meas	Analyserbox	Diode	Power-meter	Prism
OFF	IDLE	IDLE	IDLE	IDLE	ZERO
Mirror center	Mirror scan	Mirror 2H	Mirror 2V	Mirror 3H	Mirror 3V
ABOX	IDLE	CENTER	CENTER	STOPPED	STOPPED
Event data	Cycle	Fast DAQ	Scaler	Chopper	Pockelcell
STOPPED	STOPPED	STOPPED	RESET	OPEN	OFF
Hera leptons				Calorimeter HV	Fiber HV
				OFF	OFF
NOBEAM				Calibration	Beam position
				UNDEFINED	CENTERED
Enter new comment					

- The **AutoPilot** acts on FSMs only, according to a **list of rules**, e.g

hera=NOBEAM|INJECTION|RAMP|BEAMDUMP:

MoveFSM collimators CLOSED

hera=RUNNING:

MoveFSM collimators OPEN

The RC will find that moving the collimators involves the horizontal and/or vertical collimator, etc.

Summary

- New TPOL DAQ is working well
- Individual processes are interconnected by TCP/IP sockets
- Run control based on finite state machines
 - avoid to do things in the wrong order or to bring the DAQ in an undefined status
 - actions can be started/interrupted at any time in a transparent way
- The AutoPilot acts on the finite state machines only (like sitting in front of the run-control panel)
- The TPOL monitor is ready to be used
 - please test it and report bugs/missing features
- The TPOL is ready for taking data.