Slow control
EIC Hadron Polarimetry

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EIC, Slow Controls workshop

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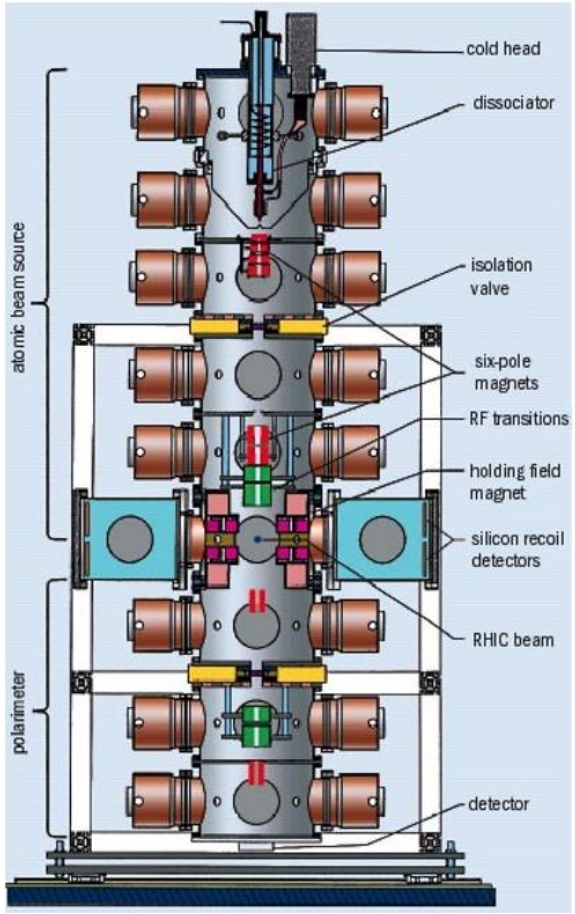
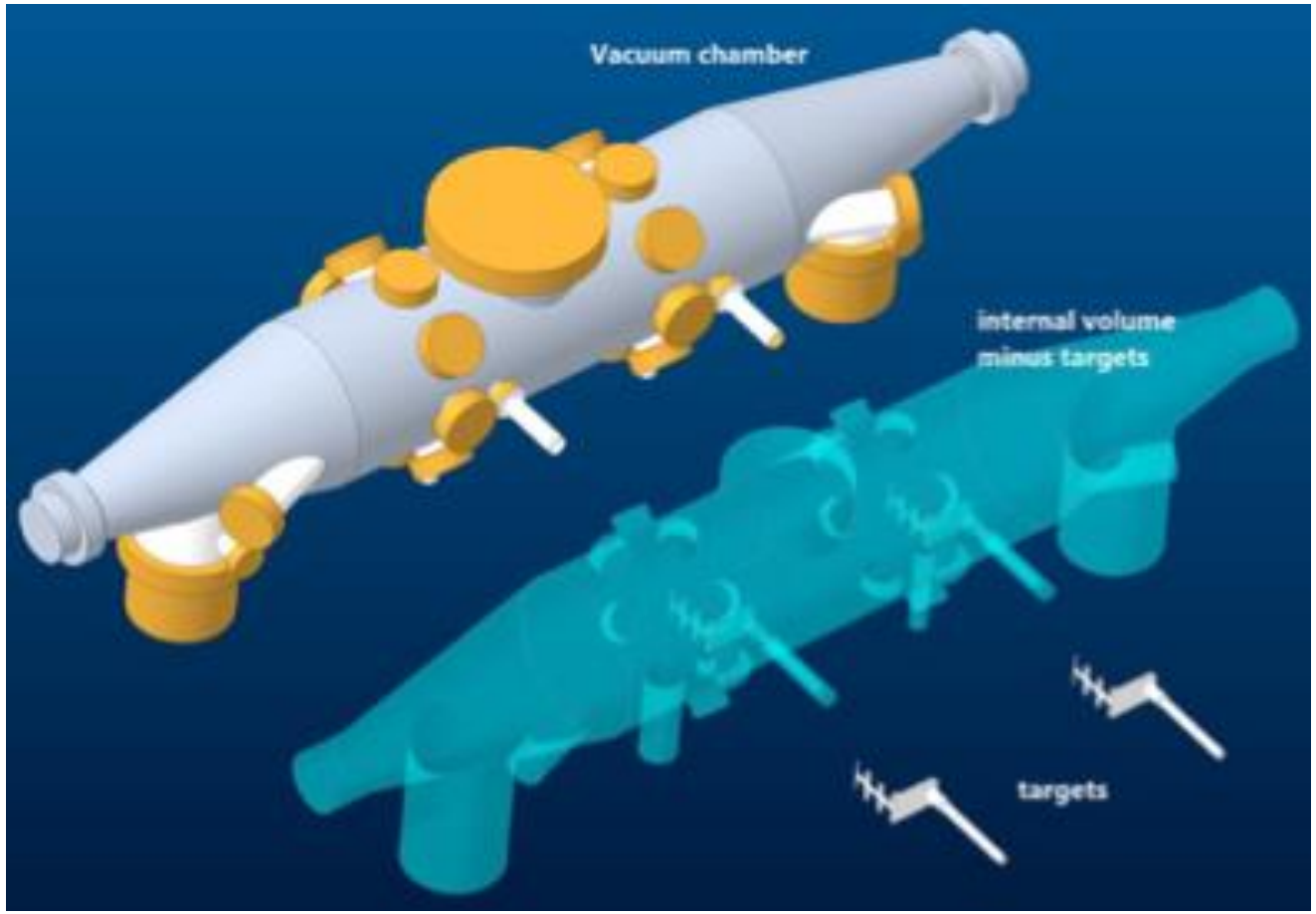
Two primary polarimeter systems

HJET



pC



HJET subsystems

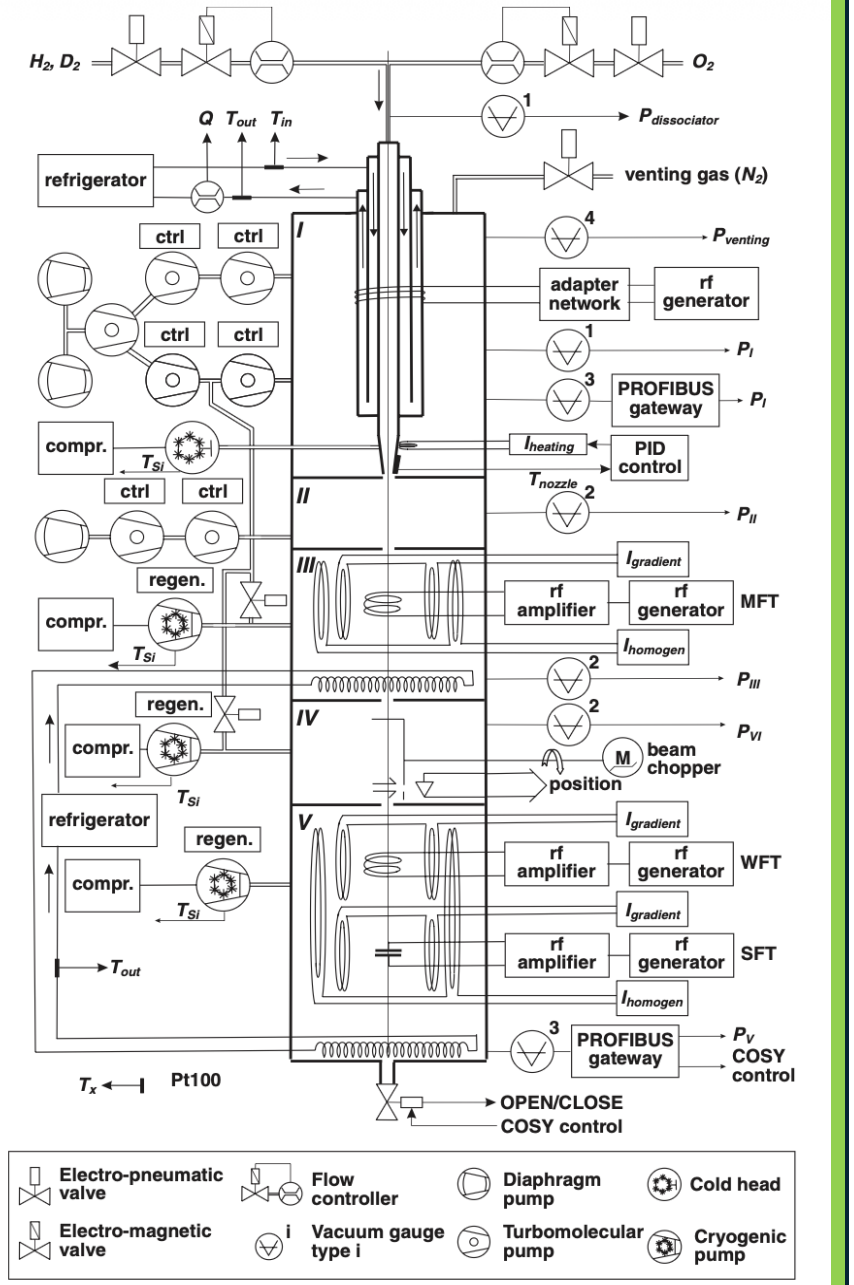
H. Kleines et al. , NIM A 560 (2006) 503

ABS (Atomic Beam Source)

- Vacuum and interlock
- Gas supply system H_2, O_2, N_2
- RF dissociator
- PID loops for temperature and chopper control
- RF Transition units
  - WFT and SFT
- Holding field magnet control

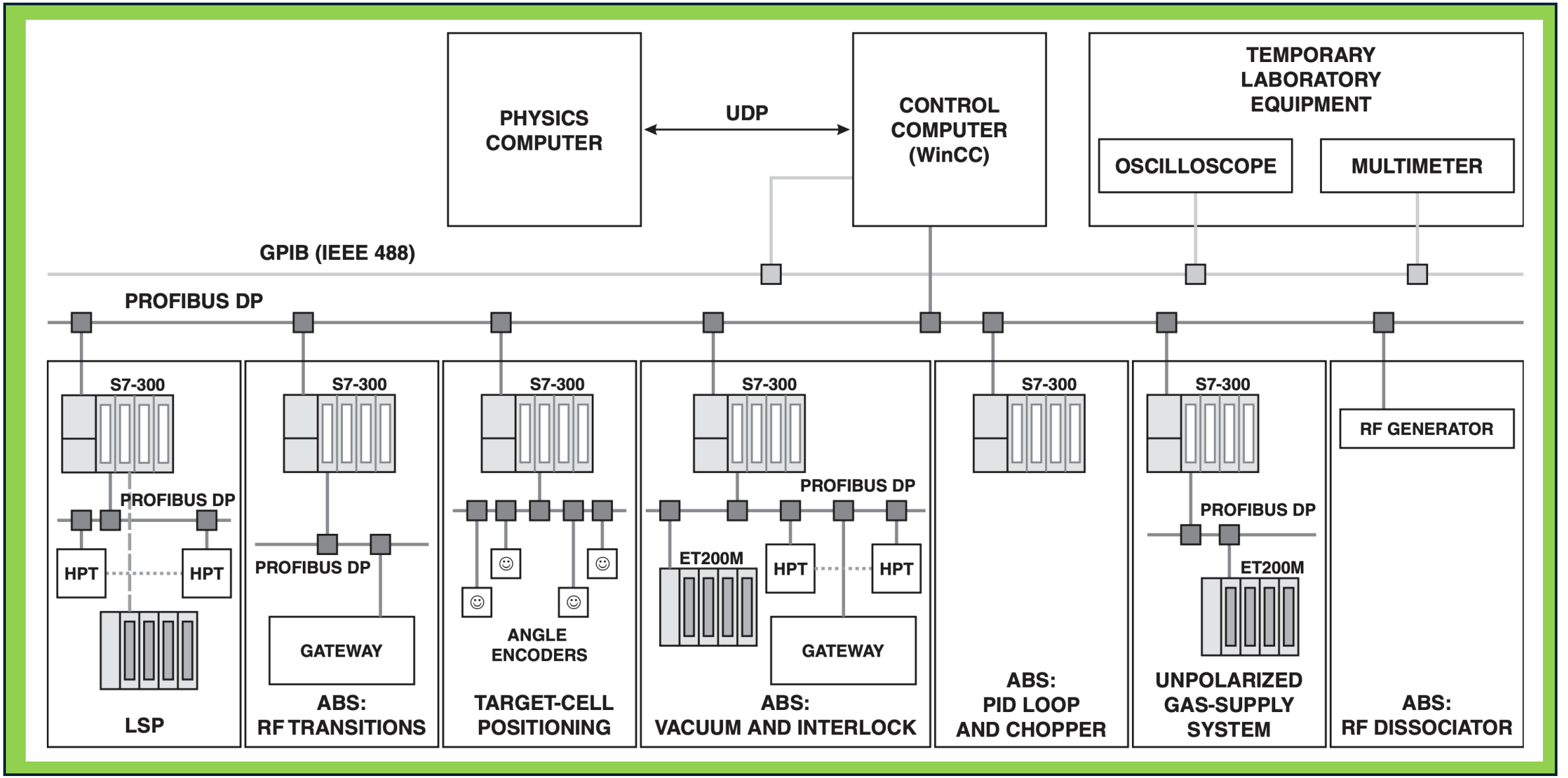
BRP (Breit-Rabi Polarimeter)

- Vacuum and interlock
- QMA (Quadrupole mass analyzer)
  - H_1 and H_2 transverse beam profiles (xy)
  - Rest gas analysis at target
  - Stepper motor control
- RF Transition units
  - WFT and SFT
- Chopper control
- Ion gauge signal detector



Structure HJET control system

H. Kleines et al. , NIM A 560 (2006) 503



pC subsystems

pC polarimeter

- Positioning of C targets in beam
  - Stepper motor control
- QMA (future)
  - Rest gas analysis of chamber vacuum
- Temperature readout
  - C targets (in progress, difficult)
  - Holders (future, easy)

Vacuum transfer chamber

- Vacuum and interlock
- QMA (Quadrupole mass analyzer)
  - Rest gas analysis to ensure C targets are clean
- Stepper motor control linear drive

Comments

HJET

- Total number of HJET process variables (PV) logged in EPICS ~ 500
- Most of these PVs are slow -> 0.1s update
- All PVs go to EPICS database
- CS Studio application for HJET
- Some subsystems require fast feedback loops (e.g., SFTs)
- Valve control to ring interlocked with ring vacuum
- Polarization + detector system info -> EPICS
  - Info time stamped

pC

- Control system will get a similar architecture as HJET
- Focus on stepper motor control for C target movement
  - Valve control for target transfer interlocked with ring vacuum
- Total number of PVs around 200
- CS Studio application for pC
- Polarization + detector system info -> EPICS
  - Info time stamped

EIC control room talks to polarimetry equipment

- Convenient to communicate directly via PVs through EPICS
  - need to provide specific timing sequences for certain tasks