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Jan. 12, 2001

HERA-B Shutdown Status & Startup Plans

- Revised HERA-B Physics Program 2001/2002
- Shutdown Activities & Detector Status
- Target Operation in 1999/2000
- Issues related with HERA
- Startup Plans - First Ideas

Revised HERA-B Physics Program 2000/2001

serious discussions and considerations concerning the future of HERA-B during the last months

⇒ final decision and summary published:
DESY telegram Jan. 4. 2001

- **PRC & EWR :** - HERA-B behind schedule
  - our competition: big and fast progress
  ⇒ HERA-B not competitive in B physics
- **Re-evaluation** of the physics program
  - conservative assumptions on detector performance
  - concentrate on a few important and reachable physics goals (by end of 2002)
  - main focus on QCD related questions and rare charm decays, e.g. B cross section and charm production

  "HERA-B Physics in 2001/2002" Dec 1, 2000
  report and addendum
  "Update of plans for 2001/2002" Dec 18, 2001

- **Approval for 2001/2002:** based on these evaluations the DESY directorate approved the experiment until the end of 2002
- **Further Future:** based on detailed re-evaluation of the experiment by the end of 2002

Shutdown Activities & Detector Status

large fraction of chambers: removed & de-assembled

→ improve efficiency of tracking detectors

promising repair & upgrade program on schedule

- **ITR:** - improved grounding scheme
  → reduces noise by a factor of three
  - replace HELIX chips for trigger chambers
  - main fraction reinstalled during shutdown
    for others: a smooth procedure < 1 day
- **OTR:** all 12 large chambers (TC and PC) removed and deassembled
  - exchange of capacitors on HV distribution boards to solve “HV loss“ problem
  - approx. 4 chambers are reassembled
  - 11 chambers will be reinstalled
  - procedure for last chamber under discussion
  - improvements on front end electronics:
    exchange trigger drivers on TDC boards
    new connector board to improve shielding
  → reduces the pickup/elect. noise
  → operation with lower thresholds
  → increased chamber effciency

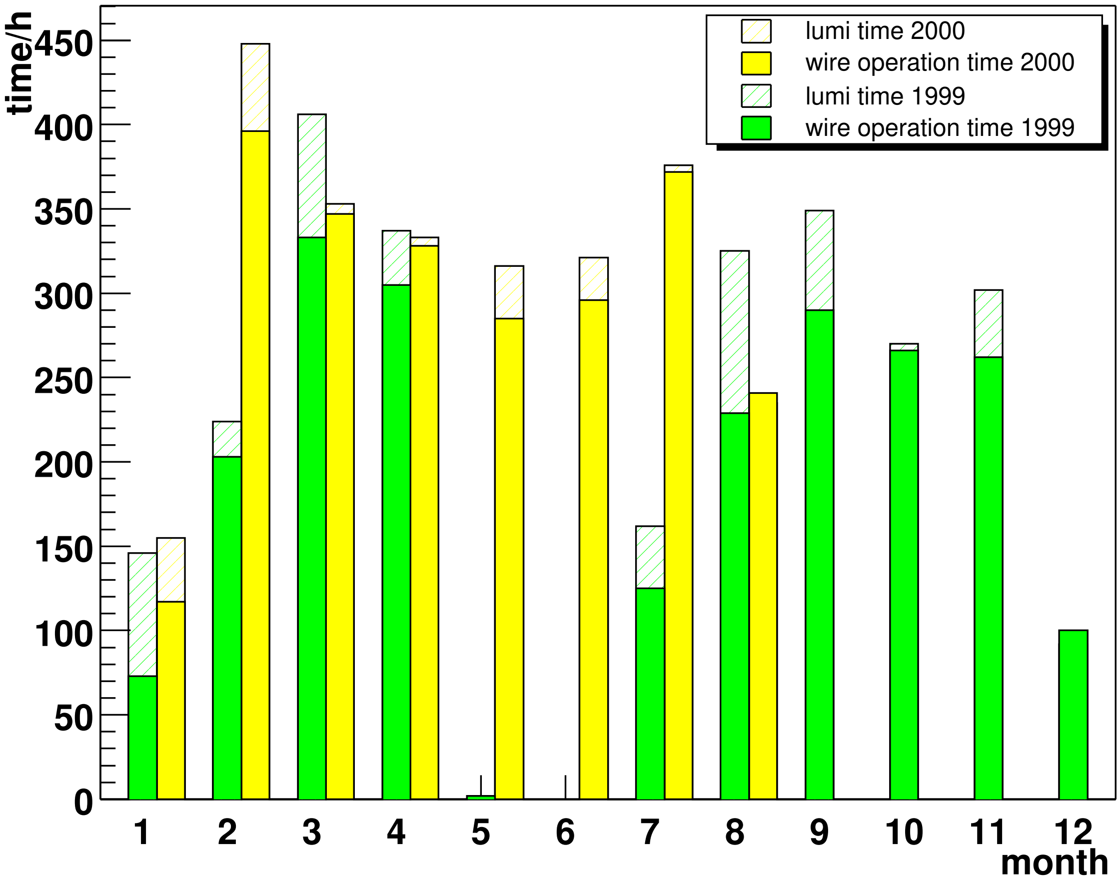
- **MUON:** repair and maintenance work on chambers, improvement of grounding
  $\rightarrow$ increased pad efficiency
  - re-evaluation of electronics chain
    R&D program for pad preamps
    $\rightarrow$ decision end of Feb.

- **FLT:** suffered from low tracking efficiency
  - important hardware work: optical links
    $\rightarrow$ increased efficiency from 95% to > 99%
  - improvement of monitoring and diagnostic
  - performance studies & data analysis:
    $\rightarrow$ progress, but not yet a final understanding of the FLT performance & efficiencies

- **VDS:** very good performance in 2000
  - complete new set of detectors for 2002
    (degradation due to radiation damage)
  - actual shutdown: replacement of three superlayers in one quadrant (one pot)
    (one bad modul, single $\rightarrow$ double sided)

Target Operation in 99/00

operation time: 1999 - 84% and in 2000 - 94%
in comparision to HERA e-p Lumi time



Lumi: in 2000 nearly $5 \cdot 10^{13}$ interactions

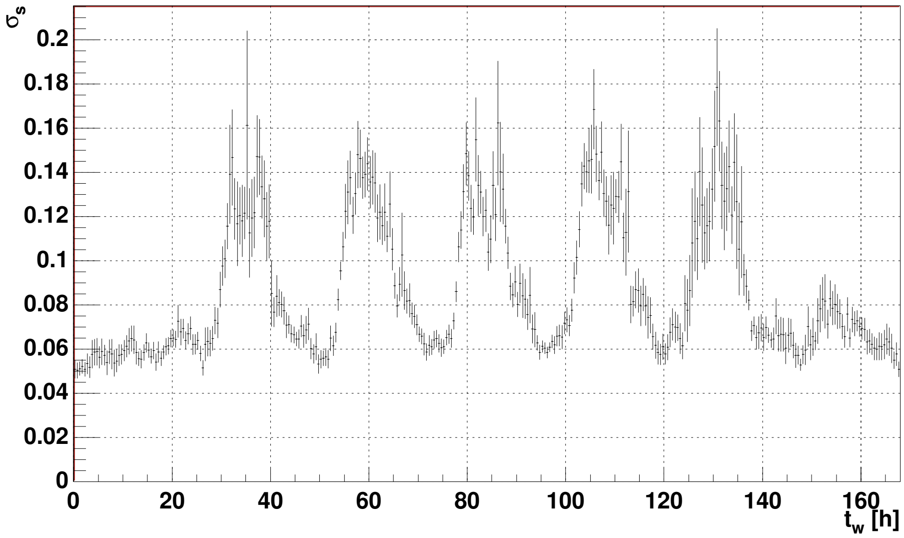
corresponds to 10^7 sec at 5 MHz

- usual aperture around 5.5 σ
- usual target operation point: $\approx 3.6\ \sigma$

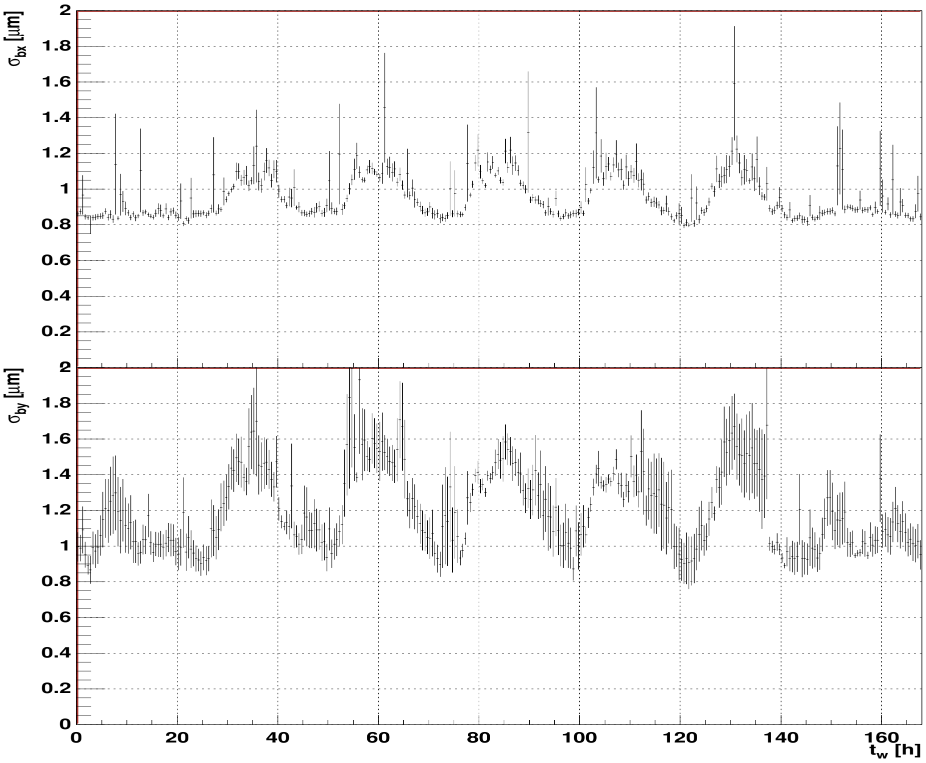
Target Rate & Beam Orbit Fluctuations

for 1999/2000 - versus time in hours of a week

→ strong impact of civic noise



Sun 0h *Sat 24h*



Issues related with HERA

- **Target Setup:** - complete new mechanics will be installed (hysteresis effects, wear out - aging, design improved, no spares available)
  - new set of improved lumi counters
  - installation of thinner wires (50 μm - round)

- **Coasting Beam:** we appreciate very much the various activities on the HERA side (optics and simulation studies)
  $\rightarrow$ continue the close and fruitful collaboration

- **VDS RF-shield:** planned to reduce the width of RF-ribbons from 12.7 mm to 7 mm (5 μm thick steel ribbons - Al coated)
  $\rightarrow$ necessary to cover complete inner acceptance
  $\rightarrow$ to be discussed with the machine

- **Beam Pipe:** complete new beam pipe between VDS – WR07 and ECAL – WL05
  12 m long – wall thickness 0.3 ... 0.4 mm
  use press-folding technique

Startup Plans - First Ideas

sequential startup and recommissioning steps

- **No Beam Period:** July/August - test of electronic components, gas systems, control system and daq system
- **Target Commissioning:** strong interest to do this as early as possible
  approx 3 times 8 h beam time needed to establish basic operation
- **VDS Pot Movement** commissioning asap - should be included in the HERA startup plans (approx 3 times 4 h)
- **Occasional Target Operation:** all early possibilites are welcome
  - operate detector and DAQ
  - perform calibration and alignment
- **Lumi Period:** moderate target rate
  → detector and trigger commissioning
  hope: short physics production run end of 2001

Access Days

first ideas and proposals

1. one scheduled maintenance day during HERA start up phase - e.g. Tue Sep. 4.
   $\rightarrow$ fix problems, finalize ITR installation

2. two consecutive and scheduled maintenance days before regular lumi operation starts (end of Oct.)
   $\rightarrow$ final preparation for lumi run
   and installation of last OTR chamber

3. Xmas shutdown 2001/2002: two weeks are necessary to exchange all VDS modules