HERA-B
Collaboration Meeting
DESY, Hamburg
June 8-12, 1998

V.M. Pugatch
Institute for Nuclear Research
Prospekt Nauki, 47
252028, Kiev, Ukraine

pugatch@mail.desy.de

Target Monitoring System.

Status and Prospects

Introduction

Charge Integrators connected to the Targets.

Si - telescopes inside the Target tubes.

Si - pad detectors at the VDS exit window.

Specification for the Target Viewing System.

Concluding Remarks

Three Component Target Monitoring System (TMS).

During '97-'98 Shutdown nearly all components of TMS have been renovated and advanced ones were installed and tested (V. Aushev, N. Tkatch).

- *Charge Integrators (ChI)⇒ :(8+2) ChI*

  ⇒ Due to effort of Nikolai Tkatch sensitivity of the ChI has been increased by factor of 4-5.
  ⇒ 10 ChI were installed into NIM crate close to the Target Stations. Eight of them are connected to the Targets and are permanently integrating 1.5 nA calibrating current arriving to their inputs through the Targets.
  Two spare ChI modules are running free with 1.5 nA calibrating current at their inputs.
  The ChI frequency output is arround 500 Hz.

  ⇒ Notice:
  1. INNER2 Target does not show any reasonable value for its resistance (short circuit inside the Target Tube)
  2. OUTER1 has obviously some problems with contacts (ChI shows 30 per cent fluctuating values (typical ChI 'internal' fluctuations are in the range of few per cent).

  ⇒ Outputs of ChI are connected to the hb-VME01 Scaler (0 - 9) which are, presumably soon, going to be used for the Target Steering.

- *8 Si Telescopes inside the Target Tubes.*

  ⇒ 8 new Si-telescopes have been installed inside the Target Tubes.
  ⇒ Notice: Preamplifiers were moved now from the Target Tubes to the immovable part of the Target Stations - This has to improve the reliability of their operation - no more 'microphone phenomena'.

⇒ All 16 Si-detectors are connected to the preamplifiers by 80 mm long cables. The signals are fed to the Electronic Container and amplified by Shaping Amplifiers (N.M. Tkatch) by factor of 50. Coincident signals from the corresponding telescopes arrive to the CAMAC Scaler. ⇒ One needs some calibration measurements before the rates from the telescopes could be used for the Target Steering.

- *16 Si-pad detectors at the VDS Exit window.*

⇒ 16 Si-pad detectors were installed at the VDS Exit window right at the edges of the HERA-B acceptance (see drawing).
⇒ The signals shaped and amplified enough to have 1/2 mip thresholds at 30 mV. Eight coincident rates are to be shown by the coresponding CAMAC Scaler.
⇒ It might be reasonable to have also 4-fold coincident rates for the perfect suppression of any contribution but the Target and/or Target up-stream created mip flow.

- *TARGET VIEWING SYSTEM-4th component of the TMS. (TVS)*

⇒ Some specifications for the TVS: ⇒ 1. The targets are visible through the quartz windows (DIA 64 mm) at the entrance VDS flange. The length of the pipe for the quartz windows - 145 mm.

⇒ 2. The 15 mm wide, 85 mm long holes were made in the r/f shielding tube with an internal DIA 58 mm. The position of the closest to the target edge - 2107 mm (680 mm from the plane of the quartz windows).

⇒ 3. The distance from the plane of the quartz window to the furthest observable point on the beam-line - 763 mm -> 2014 mm in the tank coordinate system (2002 mm - is zero).

⇒ 4. All this taken into account makes the definition for the axis of the CCD camera: 17 deg. < theta CCD < 19 deg.

⇒ The CCD camera has to be positioned at the highest possible radius at the quartz window.
⇒ This will allow to monitor all the targets from the second plane and from the first plane as well + r/f carrying rolls.
⇒ 6 mm change in the radius for the CCD position will lead to the change of the angle of 1 deg. This will lead to the change in the position of the intersection between the CDD axis and the beam-line by 90 mm !

⇒ Finally, one needs to put one single CCD - camera at the entrance window of the VDS tank to see the Target movement (15 mm long) at the distance of 680 mm with a precision of 10-20 micrometers.

- *Concluding Remarks*

⇒ Three Component Target Monitoring System is ready for the HERA-B '98 Run.

⇒ The 4th Component of the TMS - Target Viewing System is under development- lets try to install the first prototype during July '98 access