

# Contribution into H1 (DESY) Detector Software and Data Handling

V.V.Palichik

Laboratory of Information Technologies, JINR

M.Kapishin

Laboratory of Particle Physics, JINR

K.-H.Hiller

Zeuthen, DESY

H1 collaboration at DESY (Hamburg) has performed a fundamental research in the field of elementary particle physics. Dubna group is responsible for 2 detectors of H1 setup: Backward Proportional Chamber (BPC) and Forward Proton Spectrometer (FPS). The contributions described below has been accomplished for the both of them.

The additional track filtering in BPC was done for concurrent tracks in the region of radius of 3 cm by selecting the best track with the usage of a goodness of fit  $\chi^2$ -criterion. On 2004 real data this leads to decreasing of number of tracks per event average multiplicity from 5.3 to 4.3 tracks [1]. BPC alignment to Central Jet Chamber (CJC) was done. The codes created have been implemented into the official release of H1 software.

Recently the more sequential BPC alignment to both nearest detectors has been performed: CJC and backward Spaghetti Calorimeter (SpaCal) on 2004–2005 experimental data. As it was reported [2], after BPC alignment  $\Delta R$ ,  $\Delta x$ ,  $\Delta y$  – residuals between detectors became less than 0.1 cm (and were 1–2 cm before alignment) (see Fig.1-2).

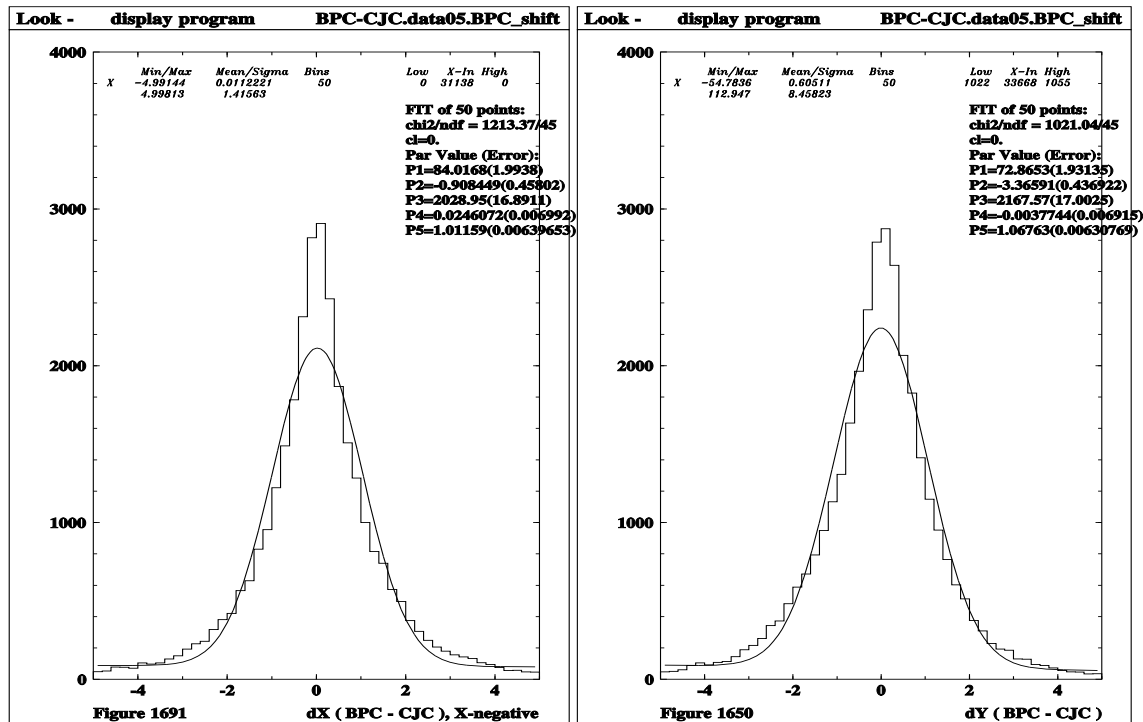


Fig. 1: Distributions of residuals (fitted by linear polynomial and Gaussian, the 4<sup>th</sup> parameter P4 is mean value of  $X_{BPC} - X_{CJC}$ , i.e. maximum of Gaussian function) between BPC and CJC X,Y-projections (cm) in the middle of BPC Z-plane for X,Y – coordinates after BPC ( $\Delta x$ ,  $\Delta y$ ,  $\Delta z$ ) – shift to CJC on 2005 experimental data

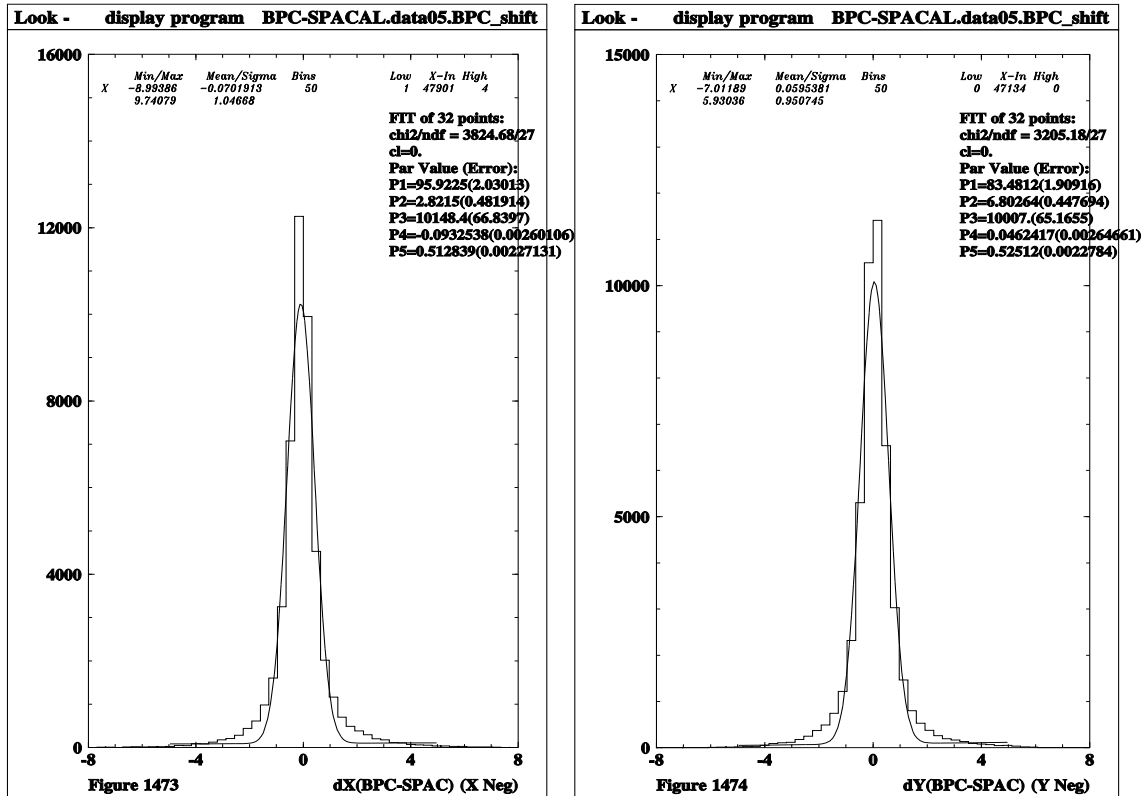


Fig. 2: Distributions of residuals (fitted by linear polynomial and Gaussian) between BPC and SpaCal X,Y-projections (cm) in the middle of BPC Z-plane for X,Y – coordinates after BPC ( $\Delta x, \Delta y, \Delta z$ ) – shift to SpaCal on 2005 experimental data

In addition the BPC alignment has been done to Backward Silicon Tracker (BST) [3] which is most close to the interaction point. The results obtained are in agreement with BPC to CJC alignment.

The procedure for the calibration of FPS vertical stations positions and global track parameters has been proposed [4]. The procedure of calibration is required for the FPS momentum reconstruction.

## References

- [1] M.Kapishin, BPC status, performance, link efficiencies, alignment, H1 Week, Detector Status and DQ Review Meeting, DESY, Hamburg, May 12, 2004, <https://www-h1.desy.de/iwork/idq/meetings/min0405012.html>
- [2] V.Palichik, M.Kapishin, BPC alignment to CJC and SpaCal, H1 Tracking Group Meeting, DESY, Hamburg, August 17, 2005, <https://www-h1.desy.de/idet/itracker/TrackingGroup/AgMin/Meet050817/>
- [3] M.Kapishin, FPS, PLUG, BPC, Data Quality and Tracking Meeting, DESY, Hamburg, September 14, 2005, <https://www-h1.desy.de/iwork/idq/meetings/ag050914.html>
- [4] K.-H.Hiller et al., FPS Status 2000-2004, H1 Collaboration Meeting, Technical Plenary, DESY, Hamburg, February 16, 2005, <https://www-h1.desy.de/iww/iminutes/talks.cm205/hiller.pdf>