

Monitoring of the automatic alignment procedure and of the alignment quality

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Monitoring of the alignment quality

- In the automatic online alignment the convergence is define by χ^2 change
- Check the goodness of the new alignment
- Monitoring the convergence of the procedure amongst iteration
- Monitoring the quality of the alignment online, offline

Check the goodness of the new alignment

- ◆ Comparison of the alignment constants to be within a certain tolerance (avoid absurd large displacement of the detector)
- ➔ automatic check by a python script with as output an Ok/notOk flag
first draft version available to be finalized and tuned
- ◆ Comparison of the monitoring plots that should show “significant” improvement (otherwise it would be consider statistical fluctuation or plots no sensitive to the misalignment)
 - ◆ tracker: chi2, residuals, overlap residuals and mass plots vs momentum, opening angle
 - ◆ VELO: chi2, residuals, PV(A-C), overlap residuals
- ◆ Data sample: same events used in the alignment determination or different sample of the same type
 - ◆ D0 sample, collision data and beam gas**Histograms produced by Brunel jobs, should be implemented in the configuration of the online alignment procedure**

Monitoring the convergence of the procedure amongst iteration

- ◆ Trend plots of the main alignment constants vs iteration numbers
first draft version available to be finalized and tuned
- ◆ Trend plots of some variable vs iteration number
 - ◆ tracker: chi2, residuals, overlap residuals mass peak and width
 - ◆ VELO: chi2, residuals, PV(A-C), overlap residuals**Histograms produced by Brunel jobs, should be implemented in the configuration of the online alignment procedure. Script to produce trends should be written**

Validation of the new alignment

- Human blessing in day 0 and automatic check in the final configuration
Scripts for automatic check should be written

Monitoring of the alignment quality

- Continuous check of the alignment quality in the lhcb online and offline monitoring:
 - tracker: chi2, residuals, overlap residuals and D0, J/psi mass plots
 - VELO: chi2, residuals, PV(A-C), overlap residuals
 - Muon: chi2, residuals

Histograms produced by Brunel jobs, should be implemented in online and offline presenter

- Monitoring that hlt1, hl2 and offline are using the same alignment constants
 - Sanity check => should be automatic comparison
 - Not clear what type of job or which histogram or tag name or direct comparison of constants

To be defined and written