

Status of PV reconstruction and PV efficiencies

P. Morawski

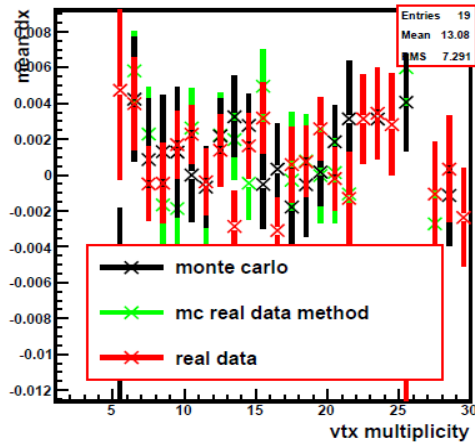
M. Witek

Recent changes

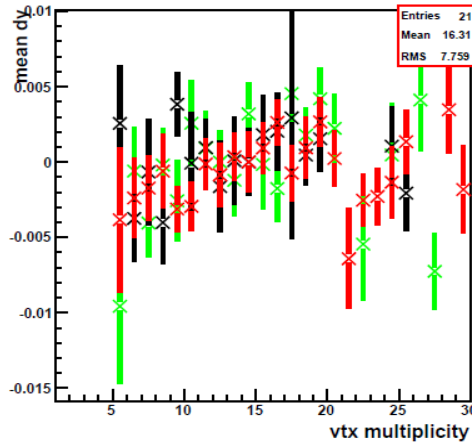
- Serious problems with PV 2D reconstruction in HLT1 (biases).
 - We can afford for Velo 3D and PV 3D reconstruction.
 - No need for PV 2D.
- Two basic PV reconstructions
 - PV Offline
 - Full extrapolation of track parameters to PV position.
 - Correct MS contribution.
 - PV 3D (Hlt)
 - Parametrization of errors for Hlt 3D tracks.
 - Tuned parametrization of MS contribution.

PV Offline - resolutions

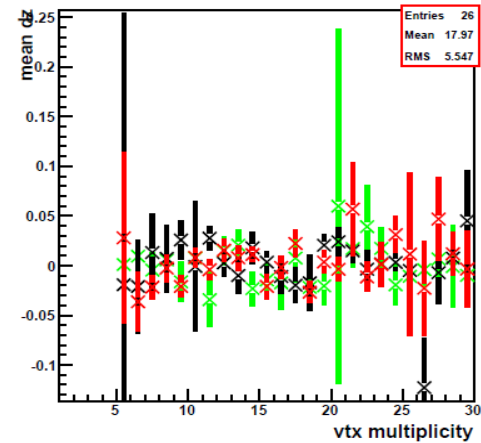
mean dx vs vtx multiplicity



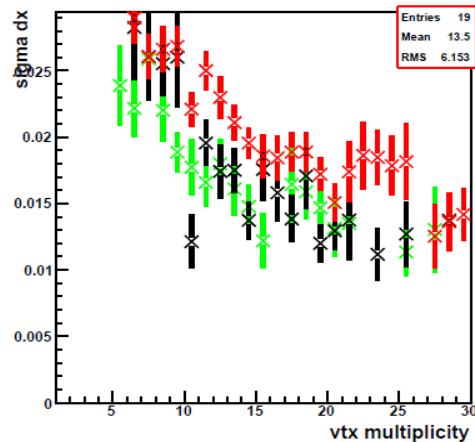
mean dy vs vtx multiplicity



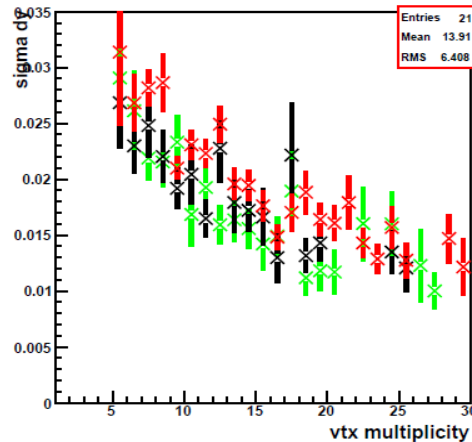
mean dz vs vtx multiplicity



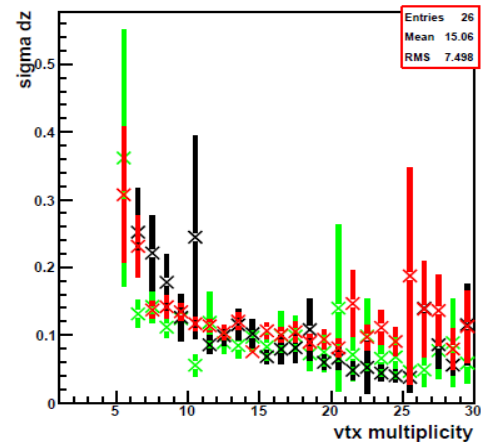
sigma dx vs vtx multiplicity



sigma dy vs vtx multiplicity



sigma dz vs vtx multiplicity



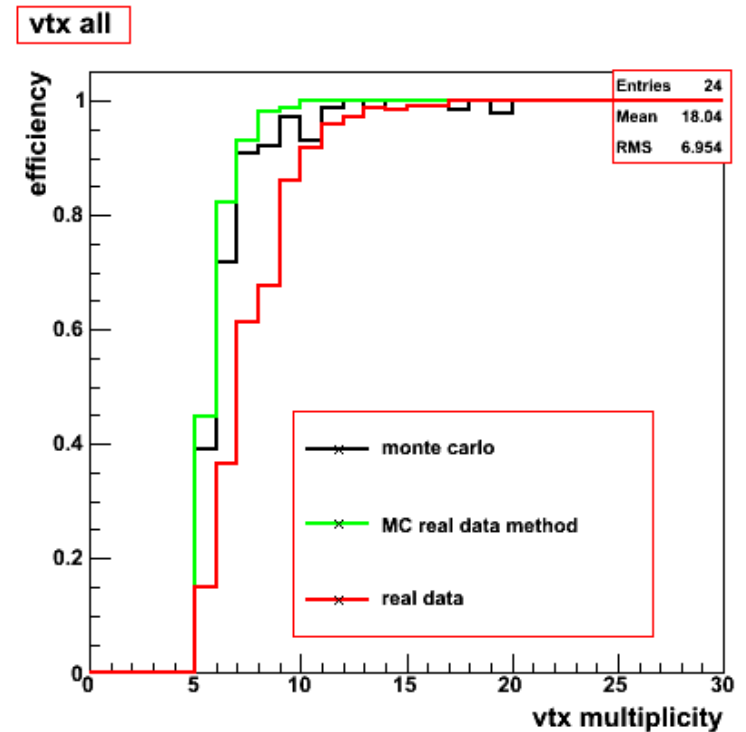
Method: split tracks in two sets of $n/2$, fit 2 vertices and get resolution from $\sigma(\Delta z)/\sqrt{2}$

Works for MC. Resolution for data slightly worse than predicted.

PV Offline - efficiency

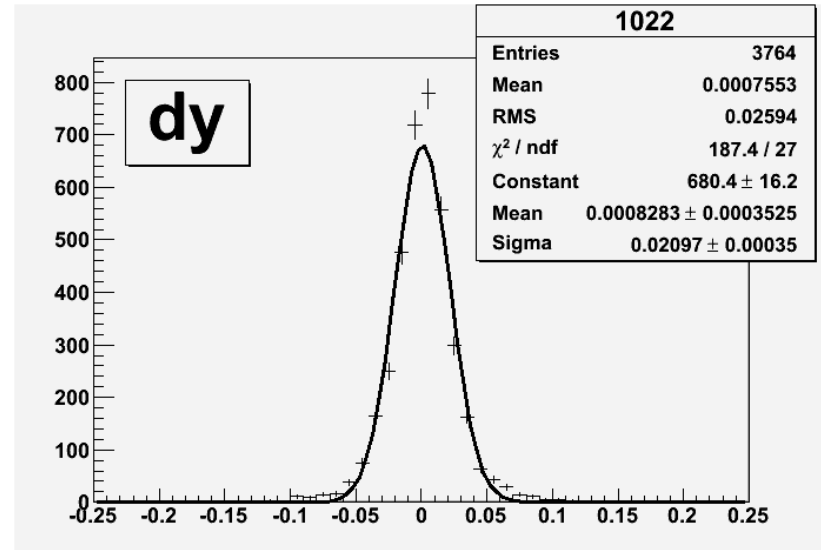
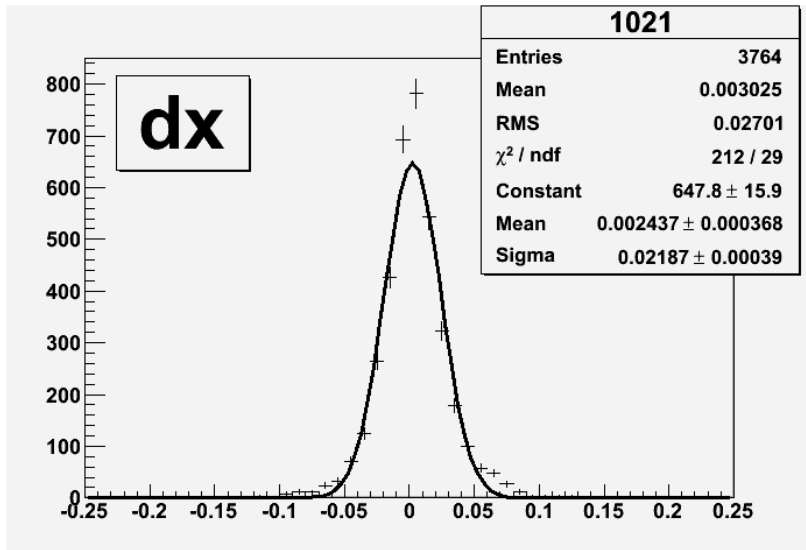
- Method to measure PV efficiency from data
 - Use reconstructed PV with n tracks as „MC”
 - Split tracks into two sets of n/2
 - Reconstruct two PVs

$$\text{eff} = \text{number of PV}_{n/2} / (2 * \text{number of PV}_n)$$

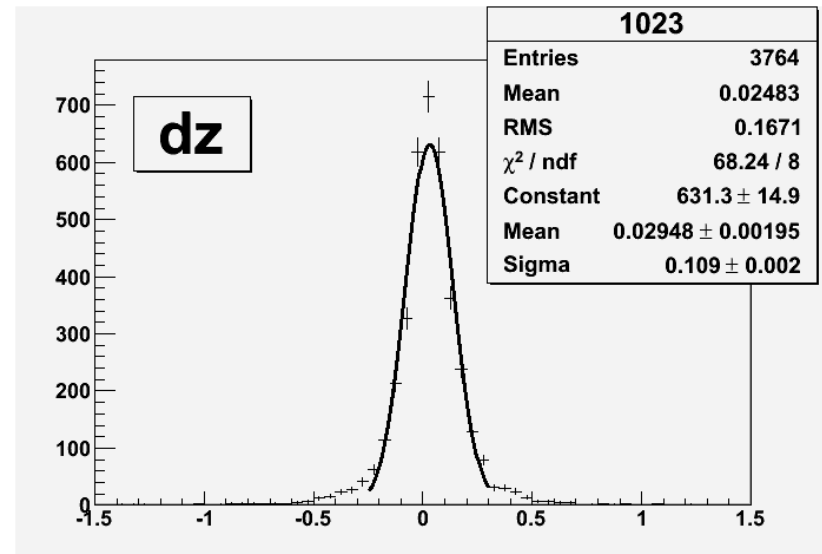


The procedure to measure PV reconstruction efficiency from data does not work properly.
→ New approach or use well tuned MC.

PV Offline vs PV 3D HLT



- Acceptable biases in x and y
- Bias in z to be understood and corrected



Summary

- Measurement of PV resolution on data is possible
 - Some checks still needed
- No method to measure the efficiency from data so far
 - Develop new approach or rely on well tuned MC
- PV 2D reconstruction no needed in HLT any more
 - Velo 3D and PV 3D reconstruction is used
 - Bias in z position of PV 3D to be understood and corrected