

Status of Momentum and Vertex Reconstruction

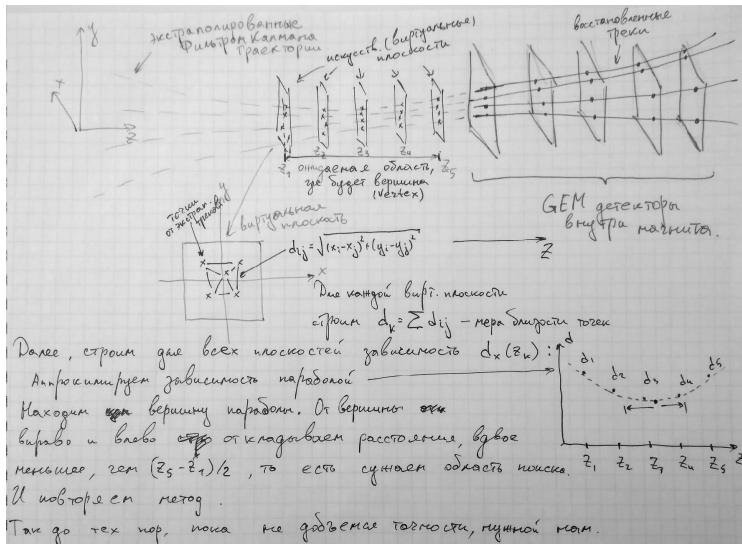


Sergei Merts

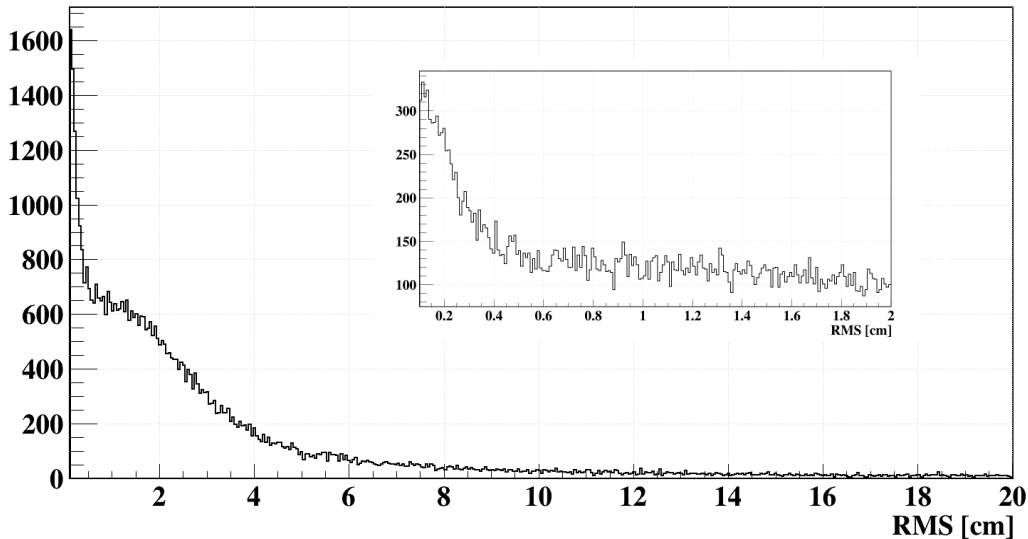
BERDS Meeting

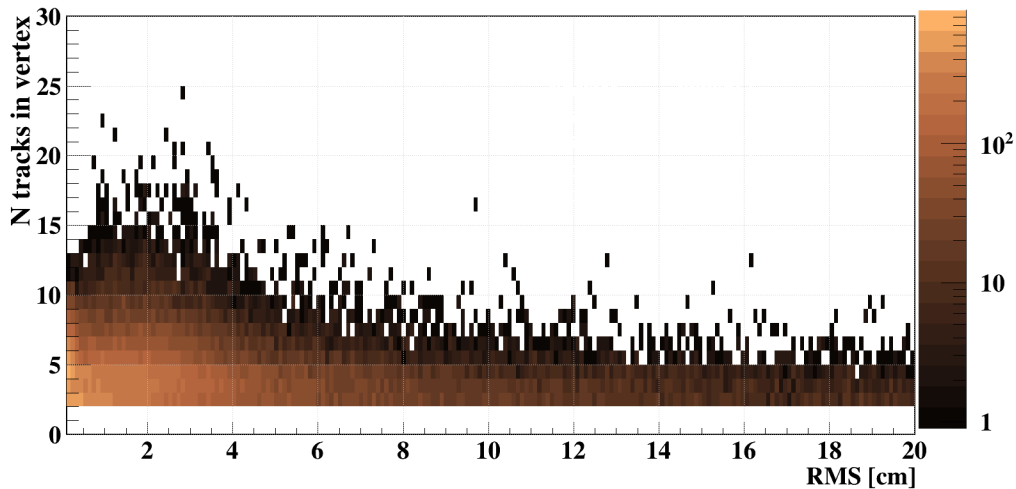
05/03/2020

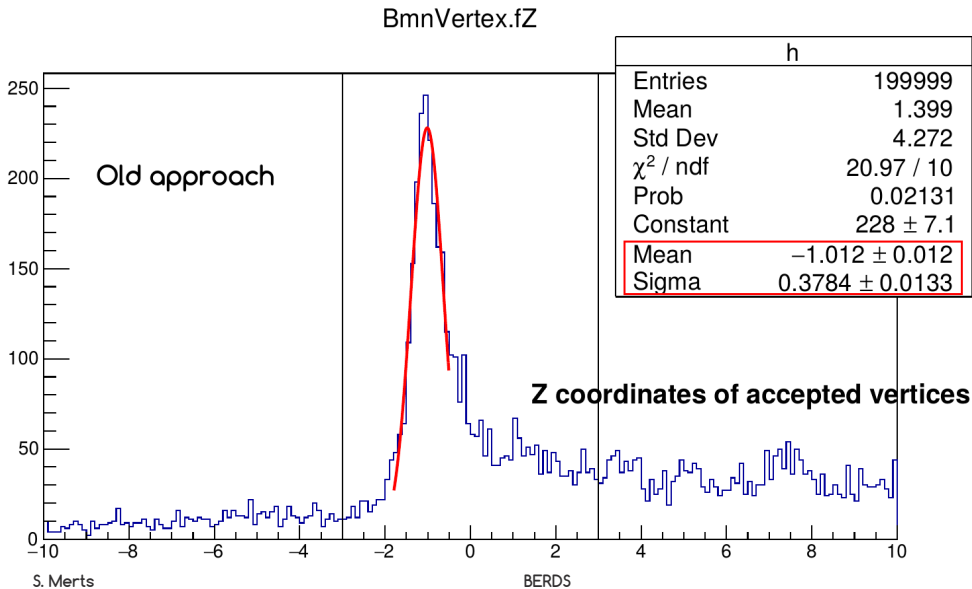
Vertex analysis



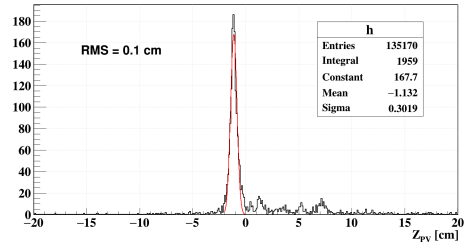
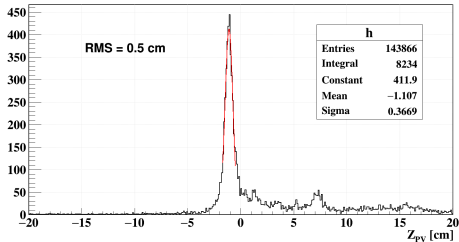
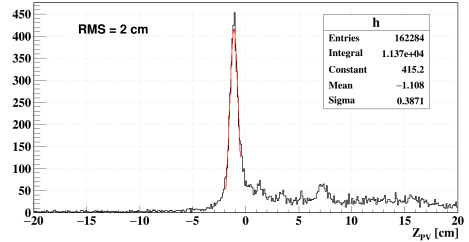
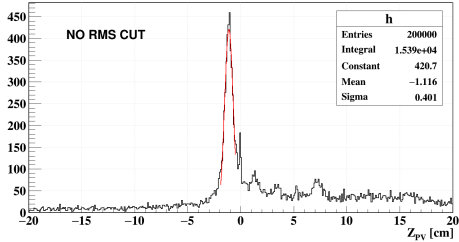
- Closeness of points: $\sum d_{ij} \rightarrow \text{RMS}$
- Local rms cut for far points exclusion chosen as 1.7 cm
- Final RMS in Z_{pV} added

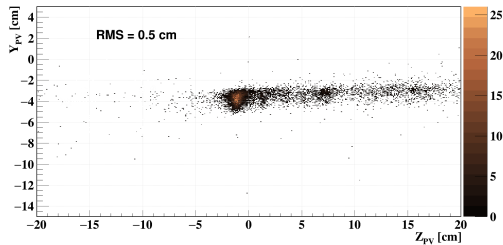
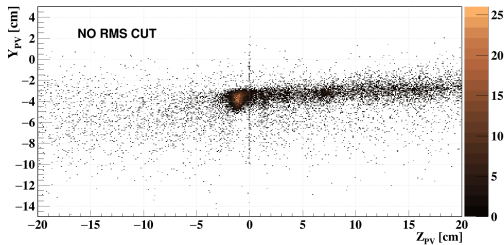
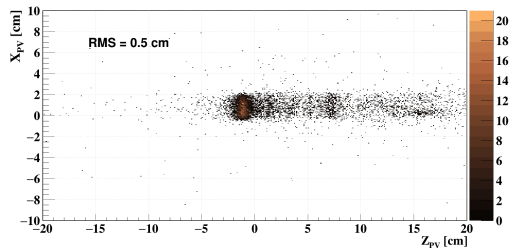
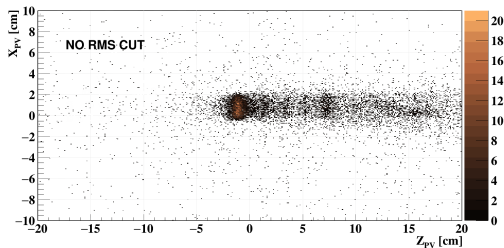






Vertex for different final RMS cut



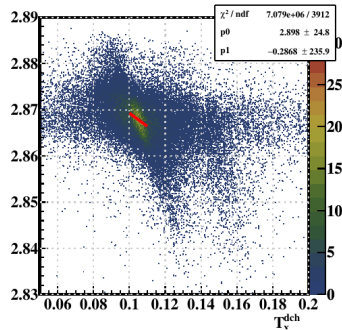
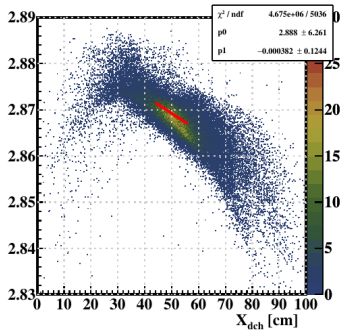
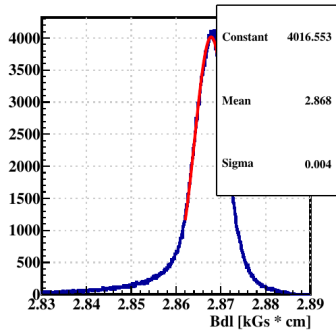


Momentum reconstruction

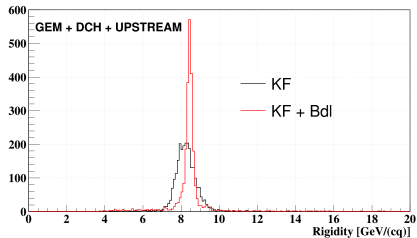
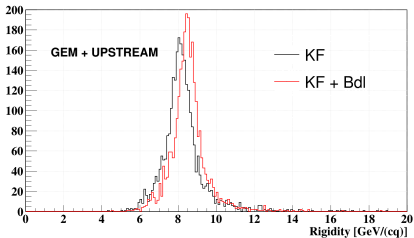
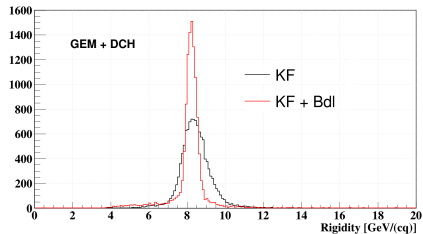
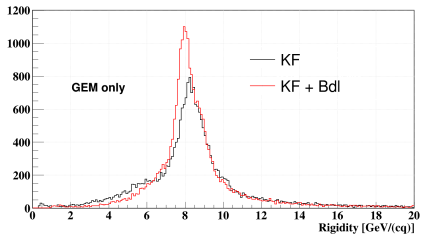
- By default parameters of Global track updated by KF with Downstream and Upstream tracks information
- It is possible to update momentum by magnetic field integral:

$$P = \frac{0.3 \cdot \int B dl}{\sin \alpha_{\text{out}} - \sin \alpha_{\text{in}}}$$

- **Cases of track construction:**
 - **M-track:** $\alpha_{\text{in}} = 0$, α_{out} from GEM track propagated to 1000 cm
 - **MD-track:** $\alpha_{\text{in}} = 0$, α_{out} from global DCH track
 - **UM-track:** α_{in} from Upstream track, α_{out} from GEM track propagated to 1000 cm
 - **UMD-track:** α_{in} from Upstream track, α_{out} from global DCH track



RUN: 2332 (No target)



Kalman Filter only

U-track	D-track	μ	σ	N	MomRes
NO	NO	8.324	0.770	26098	9.2%
YES	NO	8.137	0.521	2697	6.4%
NO	YES	8.343	0.570	11709	6.8%
YES	YES	8.219	0.455	2413	5.5%

Kalman Filter + Magnetic field integral

U-track	D-track	μ	σ	N	MomRes
NO	NO	7.998	0.461	26098	5.8%
YES	NO	8.485	0.467	2697	5.5%
NO	YES	8.237	0.255	11709	3.1%
YES	YES	8.448	0.147	2413	1.7%