Plans for the T0 determination

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First step: Recreate events

TimeGapEventBuilder

JÜLICH
FORSCHUNGSZENTRUM

- Looks for time gaps in data stream of one sub detector
- Selects hits between gaps and groups them into "pseudo event"
- Takes time width of "pseudo event" to select data of other sub detectors depending on their time resolution to build complete event

MVD

STT

Event 1   Event 2   Event 3
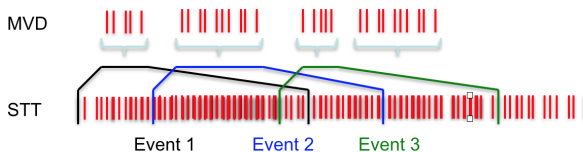
First approximation for T_0

- Base initial assumption for T_0 on MVD hits

But wait!

- Look at reaction $\bar{p}p \rightarrow \bar{\Lambda}\Lambda$ with $\Lambda \rightarrow p\pi^-$ and $\bar{\Lambda} \rightarrow \bar{p}\pi^+$
- $\rightarrow$ Displaced vertices! For how many events do all the tracks miss the MVD?
- At 1.64 GeV beam momentum: 2%
- At 4 GeV beam momentum: 31%!!!
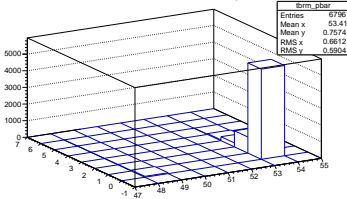- $\Rightarrow$ Significant amount of events lost at higher beam momenta!

Idea   Combine different subdetectors for event builder: MVD plus DIRC, SciTil, and/or GEM?!

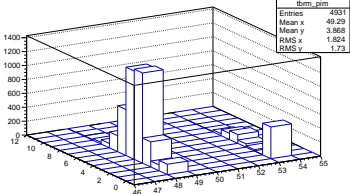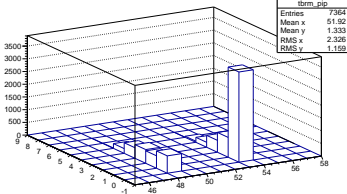# MVD hits vs track branch at 4 GeV
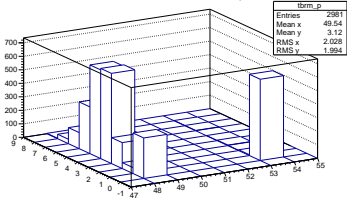
$\rightarrow$ Most tracks without MVD hits go to forward system

Next step: improve on T_0

Create tool for calculating better T_0

- Take PndTrack array as input
- Search hits in SciTil matching those tracks
- Calculate time of flight
- Use time of flight and SciTil time for new T_0
- $\rightarrow$ Can be used iteratively (e.g. to calculate more precise isochrones for STT, leading to more accurate track information, etc.)

Question Also look at other detectors with precise time information?

The End

Thank you for your attention!