VXD digitization and clustering

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In this talk

1. What is being changed in VXD digitization and clustering
2. What we need for the 2016 VXD DESY testbeam

Changes in VXD digitization and clustering

Currently:

1. Digitizers produce digits from Geant4 data
2. Clusterizers do two things:
   a. **clustering:** identify groups of neighbouring fired pixels/strips
   b. **hit reconstruction:** estimate the crossing point of a track on the sensor

Digitizers are the final point of simulation, data expected to be digits.

But: we will get clusters from the PXD DAQ: we need a different point of entry for measured data (for SVD, clustering is trivial)

Plan:

1. Digitizers produce digits and cluster them

Changes in VXD digitization and clustering

What has to be changed:

1. We need new DataStore objects to hold cluster information

   The current PXD/SVD hits are actually reconstructed hits

2. Re-organize software

Changes mostly irrelevant to tracking people.

Additions to VXD digitization and clustering

Newly added:

SVD timing: amplitudes and times of APV25 waveforms are obtained by a fit

In progress:

SVD hit u/v hit combiner (Krakow): find the best pairing of u/v hits using cluster charge and timing data, to reduce combinatorics in the track finder

What we need for the 2016 testbeam

Data handling:

- A working software implementation and database interface for using and storing data, maps, noises, APV25 waveforms, alignment parameters, run information etc.

DQM:

- Improve DQM tools so that time evolution of sensor-to-sensor correlations etc. could be monitored
- Define procedures to validate testbeam geometry and sttrip mappings

Calibration:

- Get enough data so that hit position errors and Lorentz shift calculations can be validated

Thank you