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TPC – beautiful device for the track reconstruction and for the PID

In following slides I will just present potential and real problems at high multiplicity from the reconstruction point of view

Space point reconstruction

ALICE TPC challenge – high occupancy in the PbPb
expected

Alice TPC designed to work up to dN_{ch}/dy 8000

- Occupancy $\sim 40\%$ at the inner radius of the TPC (85 cm)
- Achieved after tuning of readout geometry – small pads (angular effect) and small diffusion preferable

Performance deterioration $\sim 40\%$ for central events

- Cluster unfolding necessary but the space point resolution for the unfolded clusters much worse as for isolated clusters
- Problem – fluctuation of the shape of signal

Real data – $dN_{ch}/dy \sim 1600$ (central collision)

- No problem at all from the reconstruction point of view

Space point reconstruction -Current problems

For the 2010 PbPb data the baseline restoration filter not switched ON – additional tests needed

Consequencies:

Many clusters bellow threshold – loosing the space points
(~20 % for central events)

Moving baseline – observed dEdx depends on the track multiplicity

TPC Tracking

TPC is continuous detector

Occupancy in the extrapolation space very small (0.3 mm in ALICE TPC)

Error of the extrapolation usually much smaller than occupancy

- Much cleaner situation in comparison with ITS (Inner tracking system)

==> No problem with the random space point association