## Hyperon Tracking with the Skewed Straws in the Straw Tube Tracker

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### $p\overline{p} ightarrow \Lambda \overline{\Lambda^0}$ process

- Simulated at 1.64 GeV/c and 4.0 GeV/c beam momentum
- Generated with A<sup>0</sup> forward peaking distribution
- Four charged tracks from displaced vertices

#### $p\overline{p} ightarrow \Omega^{-}\overline{\Omega^{+}}$ process

- Simulated at 12.0 GeV/c beam momentum
- Never measured before, generated with PHSP
- Six charged tracks from displaced vertices







Figure:  $\Omega^{-}\overline{\Omega^{+}}$  production channel

# Central Tracking System Layout

For charged track reconstruction the following detectors in the central part are considered:

- Gas Electron Multiplier (GEM)
- Micro Vertex Detector (MVD)
- Straw Tube Tracker (STT)



Figure: Central part of the PANDA detector.

## Hyperon simulation and efficiencies

Only looking at tracks with a truthmatch, look for "bad" tracks that:

- is part of the decay chain,
- 0 or 1 MVD+GEM hits,
- does not enter the forward part.



Events with at least one bad track	
$p\overline{p} ightarrow \Lambda\overline{\Lambda^0}$ @ 1.64 GeV/c	6.0%
$p\overline{p}  ightarrow \Lambda \overline{\Lambda^0}$ @ 4.00 GeV/c	3.8%
$p\overline{p}  ightarrow \Omega^{-}\overline{\Omega^{+}}$ @ 12.0 GeV/c	29.5%

## Straw Tube Tracker in PANDA

STT specifications	
Axial layers	15-19
Stereo layers	8
Stereo angle	$\pm$ 2.9 deg
Spatial resolution (xy)	$150\mu{ m m}$
Spatial resolution (z)	2-3 mm



Figure: Cross sectional view of the Straw Tube Tracker.

#### Idea

Design a tracker that, in the case where a track yields too few MVD and GEM hits, uses the skewed straws in conjunction with the axial straws to completely reconstruct the track.

- The axial straws yield the transversal components
- The longitudinal component is extracted from the skewed straws by moving the isochrones to the transversal track circle

### Points to consider

- A source for time information in the case of no MVD or GEM hit
- Ambiguities when moving the isochrones to track circles
- The resolution of the longitudinal information from the skewed straws
- Efficiencies for other channels  $e.g. \equiv \overline{\Xi^+}$
- Information from other detectors