STT News

Peter Wintz (IKP, FZJ)

PANDA Collaboration Meeting, Dec-2013, FAIR

STT News

- Recent STT activities
  - Workshop summary
  - Straw production & straw layout
  - Readout systems
  - Test system installations
- Beam tests 2014
- STT timelines
- STT pre-series test in 2015/16

STT Workshop in Oct-2013

STT Hardware meeting

Thursday 10 October 2013 from **08:00** to **18:30** (Europe/Berlin)
at FZ Juelich

Thursday 10 October 2013

09:00 - 10:00 Straw Tube production *1h00'*
Speaker: Peter Wintz (FZ Juelich)
Material: Slides

10:00 - 11:00 Straw Tracker mechanics *1h00'*
Speaker: Dario Orecchini (INFN-LNF)
Material: Slides

11:00 - 11:30 coffee break

11:30 - 12:30 STT gas system *1h00'*
Speaker: Vincenzo Lucherini (LNF)
Material: Slides

12:30 - 13:30 Lunch Break

14:00 - 15:00 Front End Electronics *1h00'*
Speaker: Dominik Przyborowski (AGH)
Material: Slides

15:00 - 15:30 timing measurements *30'*
Speaker: Henner Ohm (Forschungszentrum Jülich)
Material: Slides

15:30 - 16:30 FADC Readout Option *1h00'*
Speaker: Liubov Jokhovets (FZ Juelich)
Material: Slides

16:30 - 17:30 STT Digital readout *1h00'*
Speaker: Marek Palka (Jagiellonian University)
Material: Slides

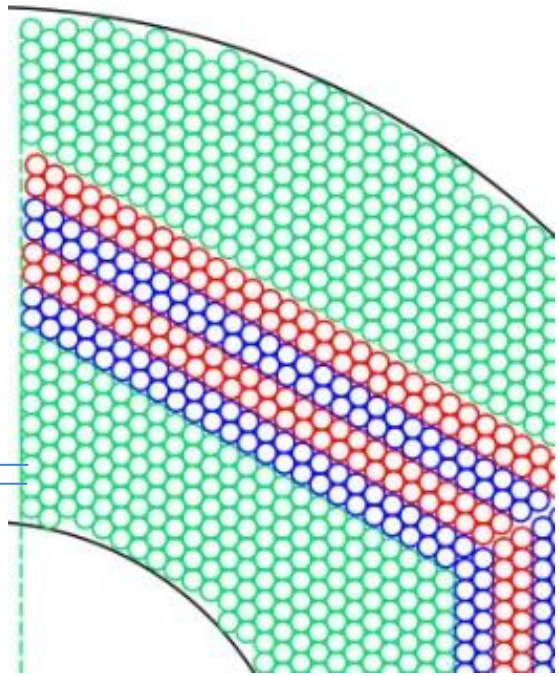
17:30 - 18:30 STT HV and Slow Control Systems *1h00'*
Speaker: Alexandru-Mario Bragadireanu (IFIN-HH)
Material: Slides

STT work packages discussed

- Straw and layer-module production (FZJ)
- STT general mechanics (LNF)
- Gas system (LNF)
- Frontend / analog electronics (Krakow, FZJ)
- Digital readout (Krakow, FZJ)
- Detector control & HV system (IFIN-HH)

Straw Layout in STT

- STT straw layout:
  - New straw pitch: 10.12 mm (~ 10 µm gap)
  - Straw diameter: ~ 10.05 mm (pressurized)
  - Mylar film wall: 27µm



- Straw layer modules
  - Determine all straw positions (soon)
  - Group straws into 4-layer modules, stereo-layer modules
  - Periphery, mounting elements, ..
  - Integration in mechanical frame → iteration with Dario

Straw Productions

- Straw production
  - final straw film specification, leakage tests successfull
  - straw series production started in Oct-2013
  - complete straw mass production takes 3-4 years, including ~50% spares

- Quality checks
  - leakage and wire tension measurement for each straw
  - long-term test sample

Electronic Readout Status

- Currently in preparation: large-scale systems

- ASIC-ToT + TRBv3:
  - new ASIC chip in design, in production soon
  - available in (late) Q2/2014, ~ 100chips (×8ch)

- FADC based readout
  - new design amplifiers & cabling, FPGA/FADC architecture
  - available in Q2/2014

Test System Installations

- Permanent STT test systems with DAQ in Juelich
- PC network ("strawnet")
- ASIC-TRBv3 readout installed last week by Cracow
  - 3× ASIC-boards, 96 channels

→ Greg's, Jacek's talks

- Cosmic ray tests as preparation for next beam tests
  - tuning setups, straw electric coupling, HV distribution
  - optimise electronic parameters (ASIC shaping)
  - define default straw operation settings (gas gain)
  - clean tracking → resolution limits

Beam Tests 2014

- Beam time requests for 2014 (COSY)
  - 1 week in Jun-2014, protons at 3.0, 0.8, 0.6 GeV/c
  - 1 week in Sep-2014, deuterons at 2.0, 1.3, 1.0 GeV/c
  - 1 week in Nov-2014, protons at 2.0, 1.3, 1.0 GeV/c
  - dE/dx range ~ 10× mips
  - aim for prot./deuteron separation
- 2 straw setups for both readouts
  - 8×24 straws and 8×16 straws
- Optional: larger straw setups if new RO systems available

2 Straw setups, beam coming from the back (Big Karl area @ COSY)

STT Milestones & Roadmap

- M3: TDR approval 1.03.2013
- M8: Pre-series test accepted 31.03.2016
- M9: Final STT construction, acceptance test 31.03.2018
- M10: Shipment to FAIR / approval for installation 30.06.2018
- M11: Ready for beam 30.09.2018
- M12: Commissioning done / ready for operation 20.12.2018

Official timelines transmitted to FAIR

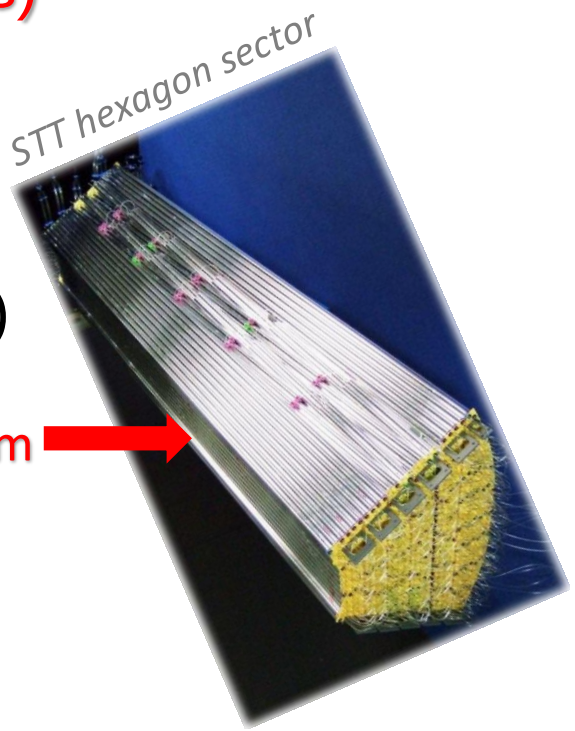
STT Milestones & Roadmap

- M3: TDR approval 1.03.2013
- M8: Pre-series test accepted 31.03.2016
- M9: Final STT construction, acceptance test 31.03.2018
- M10: Shipment to FAIR / approval for installation 30.06.2018
- M11: Ready for beam 30.09.2018
- M12: Commissioning done / ready for operation 20.12.2018

Official timelines correlated with money flow

STT Pre-Series Test

- One complete STT sector (~ 800 straws)
  - final design of straw-layer modules
  - mechanical frame
  - electronic RO system (800 channels)
  - supply system & DCS
- Assembly and installation in 2015
- Beam test at COSY 2015/16
- Complete! test



Pre-Series Test Program

- Tracking + dE/dx measurements
  - position calibration by reconstructed tracks
  - isochrone + dE/dx calibration methods
  - scatter target? → fiber, foil, .. in beam
  - final resolution
- Continuous DAQ, (PANDA-DAQ v1?)
  - high particle rates ~ 1 MHz
  - online tracking
- No magnetic field, straight tracks