News & Activities

Peter Wintz (FZ Jülich) for the STT group

LIII. PANDA CM Uppsala, TRK session, June-9th, 2015

Outline

- News
- STT activities (WPs)
- Beamtest report (STT/FT)
- FT report (Jurek‘s slides)

News - Personnel

- **Dominik Przyborowski** (AGH Krakov) finished his Ph.D., was key-person for ASIC design (PASTTREC)
- **Tomek Fiutowski** (AGH Krakov) contact person for ASIC development

- **Harout Ohannessian** (IKP, FZ Juelich) finished his master thesis
- **Alexandros Apostolou** (KVI Groningen, Ph.D.) research visit in Juelich, took over data analysis

- **Pawel Strzempek** (Jagiell. Univ Krakov) presented STT/FT at ELBA - conference

Group Activities

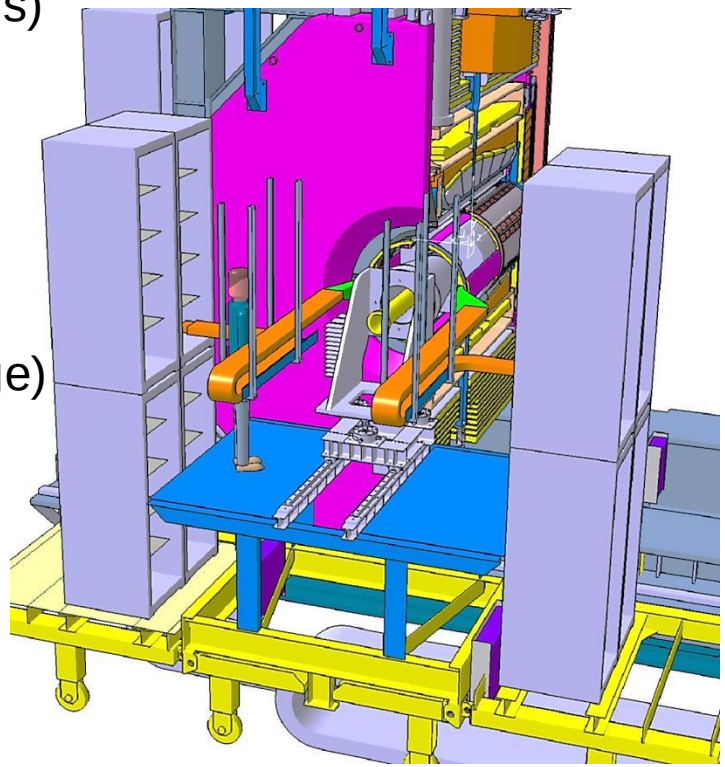
- **March-25/26th**: Frascati-Juelich WShop, CF&STT prototype frame assembly
- **April-9/10th**: PANDA DAQT-FEE Wshop at GSI
- **April-27/28th**: PANDA Mech. WShop at GSI
- **May 4th-10th**: COSY testbeam time for STT / FT, FADC & ASIC/TRB readout

- **Summer**: Installation of STT test systems in new beam area (COSY-TOF)
- **Nov-2015**: 1 week beam time requested, CBAC meeting on June29/30th
- **2016:** Further beam tests planned
- **Q2 / 2016**: “Pre-series“ test

Group Activities: Mec. WShop at GSI

- Topic: Integration & installation of detector systems in Target Spectrometer
- Installation procedure for STT & CF-System presented by Dario
- STT services (cables & gas pipes)
- Rack positions downstairs (to be verified by us)
- Patch panel requirements

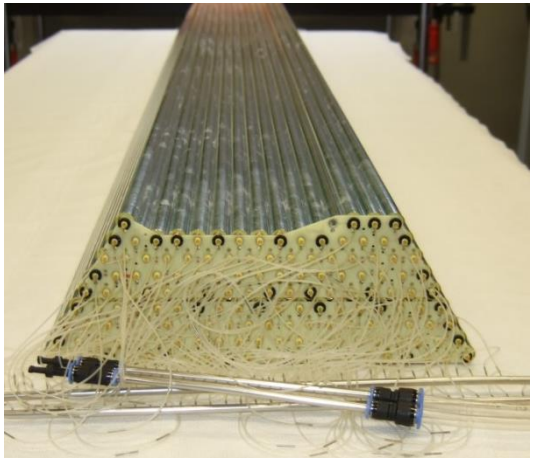
- STT system concept: system is split into
  two separated semi-barrels (L/R)
- Closed cable chains for L/R – barrel (in orange)
- To be further worked-out
  (position, cable bending radius, ..)



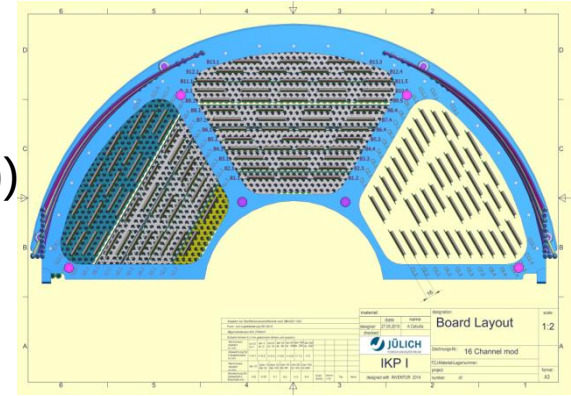
STT Status: Mechanics

- CF & STT prototype frame system installed in Juelich (Mar-25/26th)
- Concept of straw module mounting in protot. frame

- Straw mass production ongoing
- Re-checked wire tension of all produced straws
- First quad-layer modules assembled (new pitch)
- Reminder: 2nd-leg effect if improper pitch

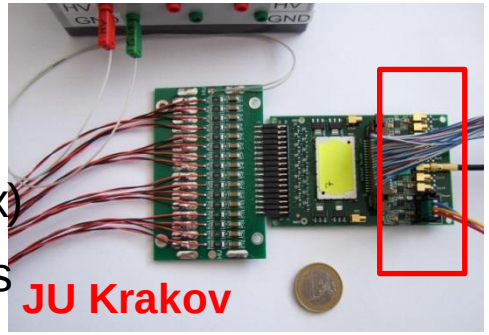


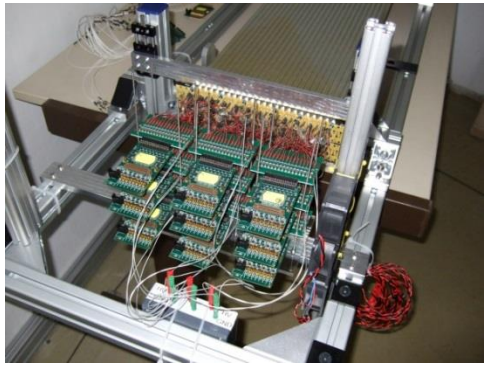
- Frontend layout (CAD)
- Gas manifold pipes
- 134 FE-boards (2x ASICs))

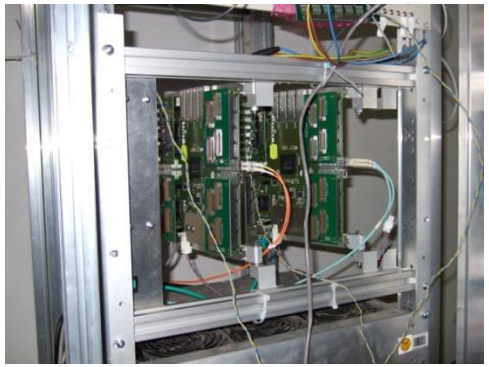


STT Status: Electronic Readout System

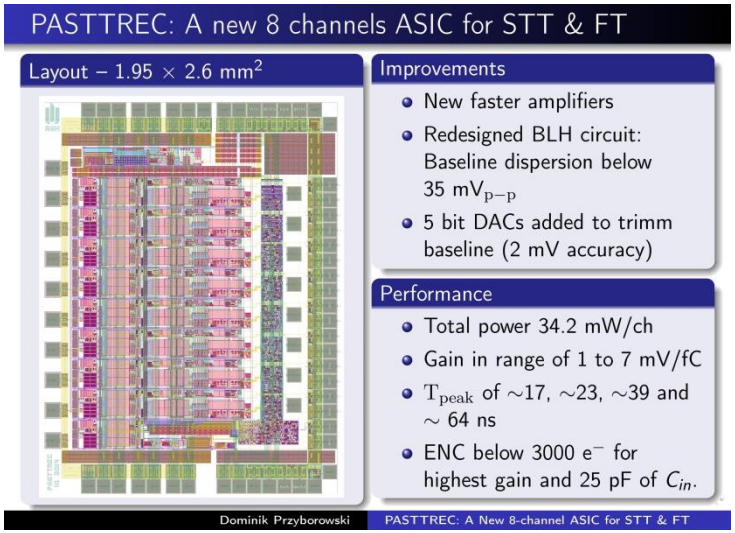
- ASIC/TRB readout (time-over-threshold)
- New PASTTRECv1- ASIC & FE-boards
- 2 ASICs (8ch) per board, additional analog out (red box)
- LVDS micro-ribbon: 16×signal out, 4×ASIC control lines
- ASIC setting by TRB-FPGA (gain, thresh. peak time, BL, TC,)
- First tests in beam last May, to be continued
- New TRB3 boards,multi-board crate design





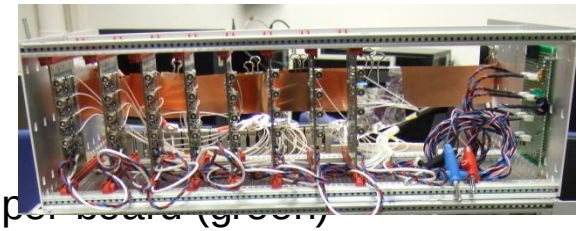


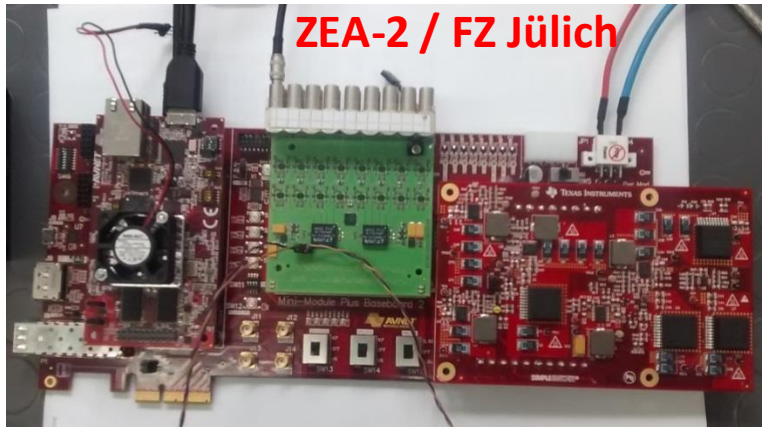
ASIC design by
AGH Krakov



STT Status: Electronic Readout System

- FADC readout, front-end electronics free (FEE-free)
- Straw signal transmitted via mini coax cables (1mm Ø, 10-12m), HV stable
- Amplifier backend, HV distribution backend
- 240MHz FADCs, 128ch (WASA@COSY)
- New FADC: LTM9011-14
  - 14-Bit, 125Msps Low Power Octal ADC (8ch), 2 ADCs per board (green)
  - ADC readout via commercial FPGA board (AvNet with Kintex-FPGA)
  - 1st test board (16ch) in May beam time, 2 more boards upcoming
- Lower sampling of straw signals to be verified (beam tests)
- To be Done: integration of amplifier & HV distribution in/to FADC board



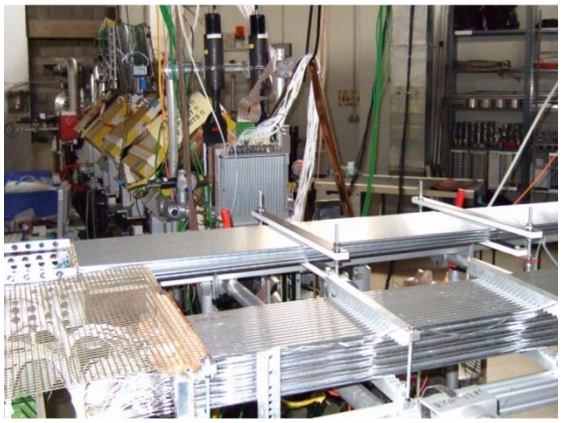


Beam Test Report

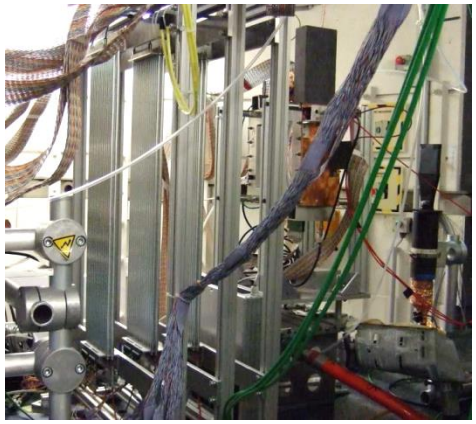
- One week beam time in May 4th – 10th, proton beam: 3.0, 0.8, 0.6 GeV/c
- STT test systems
  - FADC readout, 128ch (240MHz FADC), new FADC test board (16ch, 125MHz)
    - completion of dE/dx series measurement
    - test of new FADC (lower sampling), comparison of resolutions
  - ASIC/TRB readout, 144ch
    - new PASTTREC(v1) – ASIC (8ch), new ASIC front-end boards
    - new TRB3 boards & firmware, new data format
    - new ASIC control via TRB-FPGA
- Forward Tracker prototype modules (FT1-2)
  - 3x 32 straws, 68cm straw length, double layers (2x16 straws)
  - ASIC/TRB readout
  - Summary report (Jerzy's slides)
- Additional scintillators for triggering, straw chambers, GEM for beam monitor

Beam Test Report

- STT - FADC test system: readout unchanged, very reliable (Krzysztof's talk)
- STT - ASIC/TRB test system: completely new readout system
  - TRB/FPGA problems at high counting rates, STT: ~75 straws × 300kHz
  - Crashes at readout rates > 10 kHz → operated with trigger limit set
  - ASIC setting via TRB-FPGA unreliable → higher NL (oscill.), wrong settings
  - FPGA code now updated by GSI, tests ongoing in Krakov
  - Beam data inspection ongoing, preparations for next beam time (Nov-2015)
- FT - ASIC/TRB: much less affected, fewer straws in direct beam



The two STT test setups (beam from back).



Three FT prototype modules with 3x 32 straws (beam from left).

FT Beam Test Summary

Jurek‘s
Forward Tracker
Beam Report
Slides
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