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# STT STATUS

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- PANDA-STT
  - Status
  - Calibration
- PANDA/HADES-STS1 (Phase 0)
  - Status
  - Timelines

## News & Activities

- News

- In-kind contract with Krakow concluded, contact person: Marek Idzik (AGH Krakow)
- Budget available for STT & FT readout
- Important: not all work items for STT covered in contract (FE-cooling, HV coupling boards, ..)

- Activities

- Phase 0 Straw Station STS1 for HADES upgrade
- Synergies for PANDA-STT
  - Front-end electronics (PASTTREC FE-boards), TRB readout & DAQ
  - Straw system tests under experiment conditions, event tracking and PID ..
  - Differences: experiment HW trigger and lower DAQ rates at HADES

- **Critical remark: running short of electronic components for phase 0 in-parallel testing**

# PANDA-STT Status



## Current Developments

- Synergies with HADES
  - New chip housing at FEB under investigation (with HADES-MDC group)
  - Next generation TRB with better FPGA, higher BW datalinks
  - Integrated ASIC-TRB architecture (for HADES-MDC)
- PANDA-STT calibration → *Gabriela P.*
  - Data analysis from in-beam test campaign in 2018
  - Methods and calibration steps
- STT aspects for simulation and tracking

# STS1 System Overview

## Reminder: PANDA-FT3/4 Layout & Dimensions

- 4 Straw double-layers
  - Orientation:  $\varphi = 90^\circ, 0^\circ, 0^\circ, 90^\circ$
  - Z-distances: 118.6 mm, 281.4 mm, 118.6 mm (d-layer middle z posi.)
  - 20 modules w/ 16 straws each
  - Beamhole by split straws (2x8 straws per d-layer)
- Straw specs
  - 27 $\mu$ m Al-mylar film,  $\varnothing_{ID}$ =10.00 mm, 766mm length
  - Straw pitch: 10.14mm, z-pitch in d-layer: 8.78 mm
  - Ar/CO<sub>2</sub> at 2 bar (abs.)
- Module perp alignment by Rohacell/CF bars (2x0.3 mm CF tapes)
- Electronics:
  - 704 readout channels, 44x FEBv3, 88x PASTTRECv1
  - 4x TRB3, 1x RO crate

STS1 Station



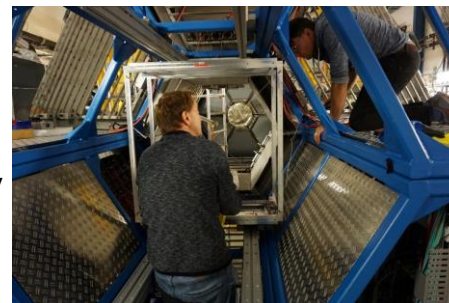
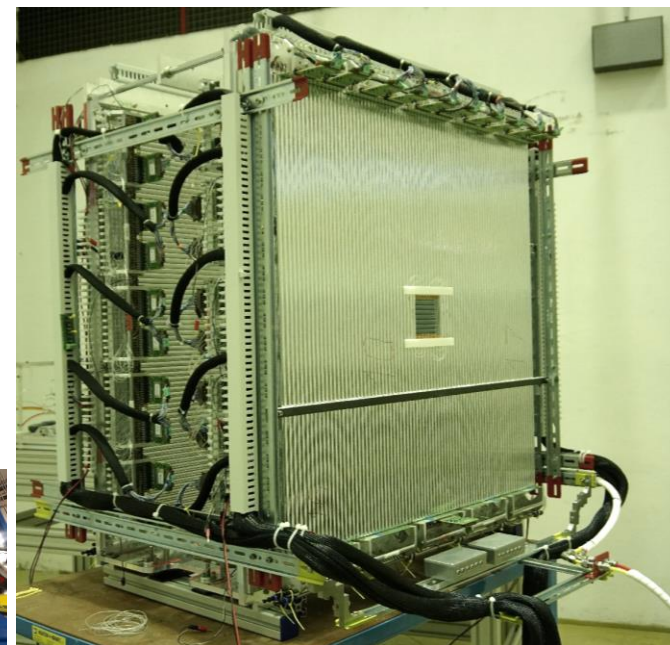


# STS1 Status

## Straw Modules & Mechanics

- Straw modules mounted in mech. frame
  - 3 d-layers gas tight since Dec., ~ 2 mbar/h\* (= permeation thru Mylar)
  - 1 d-layer with leak, repaired last week, now at ~ 1 mbar/h\*\*
- Very limited space in ECAL frame (~ few mm to blue profiles)
  - But FT3/4 dimensions were requested
  - Challenging designs and optimisations were necessary
  - All cable-routing downstream from STS1
- Frame test mounting in HADES done (Oct. 2019)
- Protection shields (moveable) in ECAL frame installed (Jan 2020)
- Transport carrier frame produced (w/ damping) (Feb 2020)
- Designs & install by Artur D. & Michael H. (IKP@FZJ)

\*Incl. 2x50 m piping  
\*\* only straw d-layer



# STS1 Status

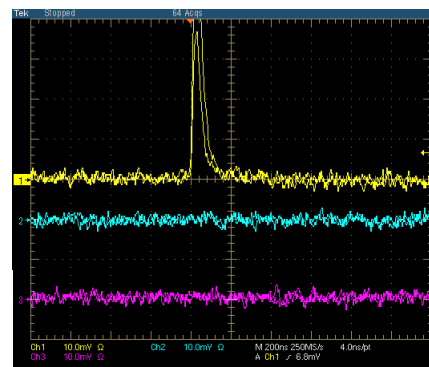
## DAQ & System Tests in Julich

- TRB3-DAQ set up and running in Julich (Pawel Kulesa)
  - TRB3 new firmware installed, multi-board DAQ w/ time synchro
  - TDC calibration, ASIC control, also ongoing..
  - Started from scratch

- Data taking started ( $^{90}\text{Sr}$ , later cosmics)
  - One complete d-layer readout by DAQ
  - Clean drift time spectra (raw data, 1st tests, gas gain  $< 1 \times 10^4$  !)

- FEBv3 tests & BL tune started
  - Noise level seems very low
  - Cabling designs seem ok

$^{55}\text{Fe}$  signals (analog out, FEBv1), NL  $\sim 2$  mV

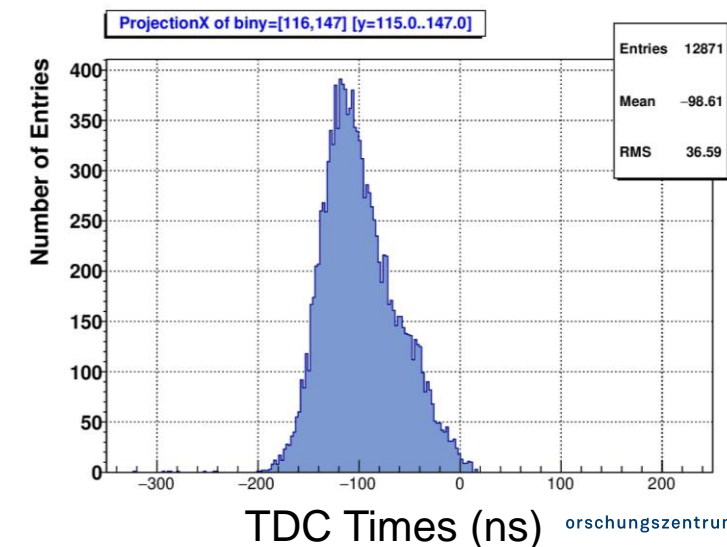
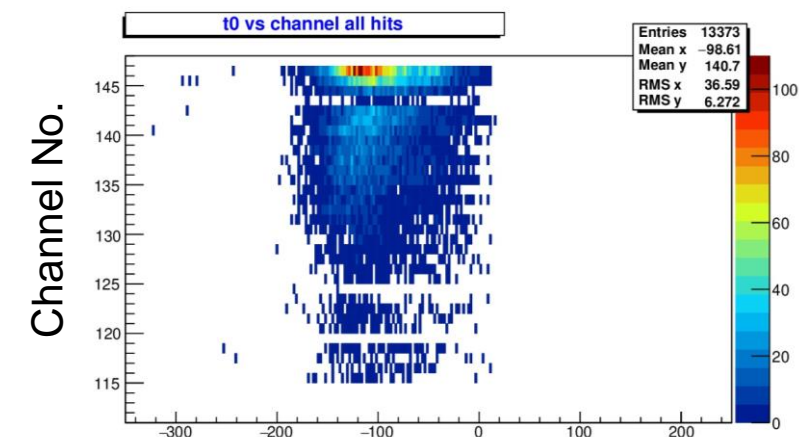


Count rates per 10s:  
HV off, gain1, thresh  
0mV, BL=0 (middle)

Reg	Channel	e000	e001	e002
c000	0	94143	94143	94143
c001	1	0	0	0
c002	2	0	0	0
c003	3	0	0	0
c004	4	0	0	0
c005	5	0	0	0
c006	6	0	0	0
c007	7	0	0	0
c008	8	0	0	0
c009	9	0	0	0
c010	10	0	0	0
c011	11	0	0	0
c012	12	0	0	0
c013	13	0	0	0
c014	14	0	0	0
c015	15	0	0	0
c016	16	0	0	0
c017	17	0	0	0
c018	18	0	0	0
c019	19	0	0	0
c020	20	0	0	0
c021	21	0	0	0
c022	22	0	0	0
c023	23	0	0	0
c024	24	0	0	0
c025	25	0	0	0
c026	26	0	0	0
c027	27	0	0	0
c028	28	0	0	0
c029	29	0	0	0
c030	30	0	0	0
c031	31	0	0	0
c032	32	0	0	0
c033	33	0	0	0
c034	34	0	0	0
c035	35	0	0	0
c036	36	0	0	0
c037	37	0	0	0
c038	38	0	0	0
c039	39	0	0	0
c040	40	0	0	0
c041	41	0	0	0
c042	42	0	0	0
c043	43	0	0	0
c044	44	0	0	0
c045	45	0	0	0
c046	46	0	0	0
c047	47	0	0	0
c048	48	0	0	0



$^{90}\text{Sr}$



# STS1 Timelines & Scheme

## Installation at HADES

- STS1 system pre-tests completion in Julich
  - Full system test (ASIC settings, straw positioning, DAQ)

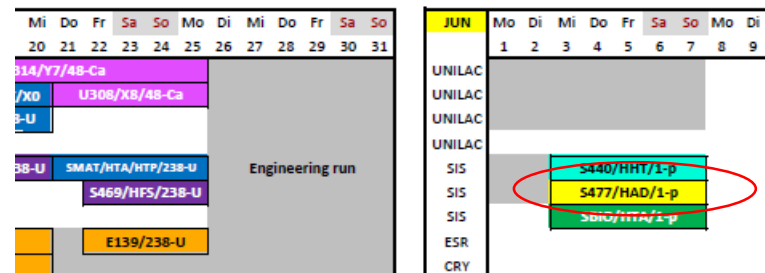
End of April

- Transport to GSI
- System set up and functional tests in HADES

Beginning of May

- HADES test beam time:
  - accelerator engineering run
  - Expect only hours of beam for us during nights

June, 3<sup>rd</sup> – 7<sup>th</sup>







*Thank you for*

*your attention*