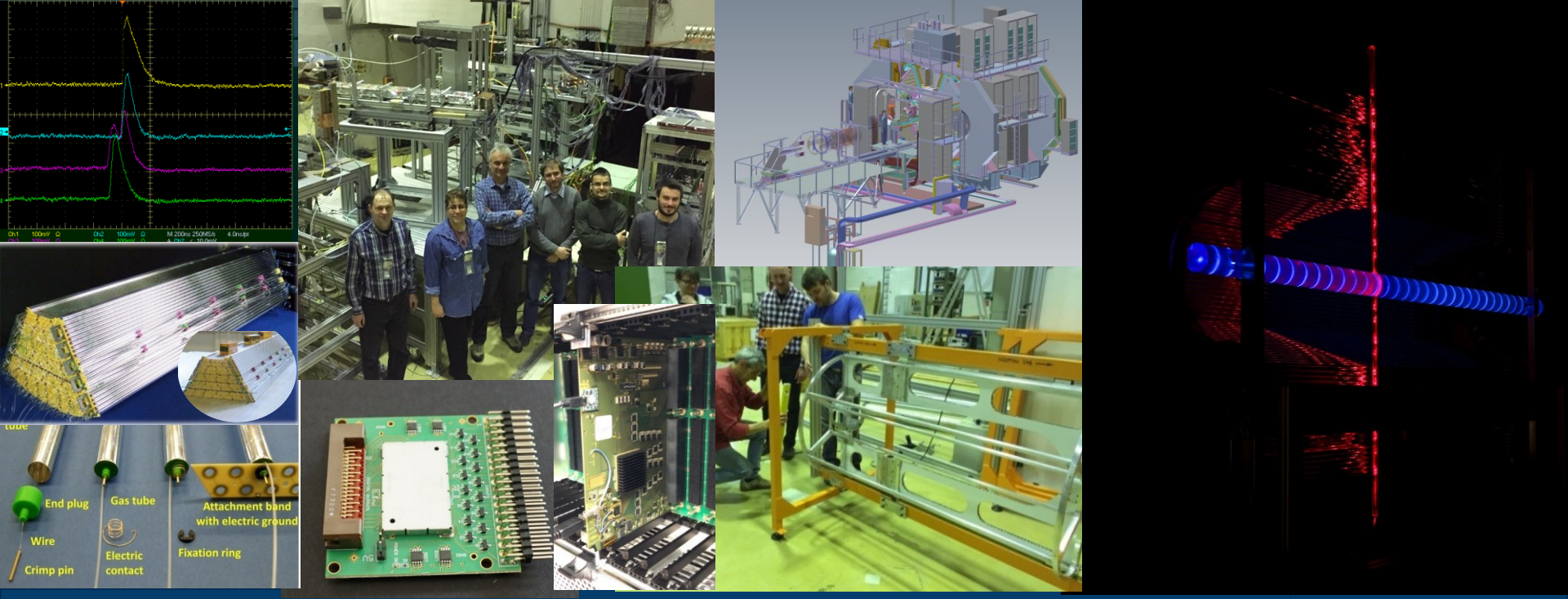
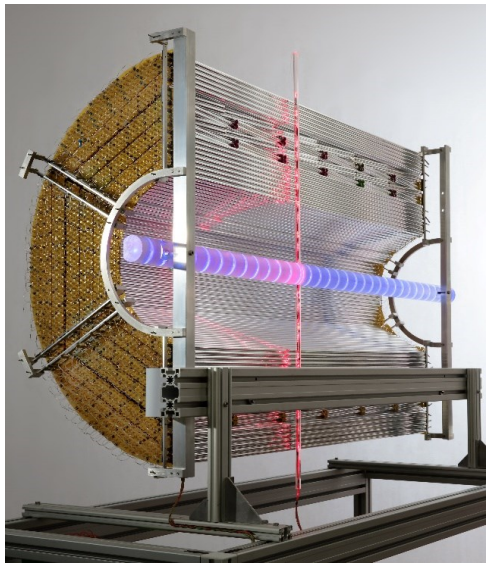


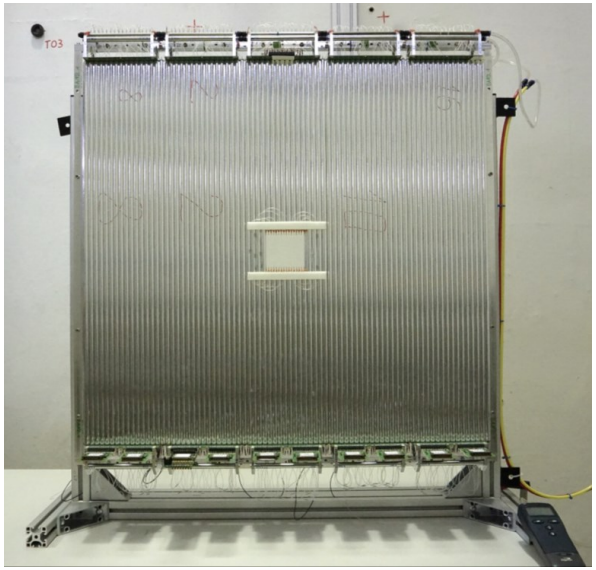
STT Status Update

June-26, 2019 | Peter Wintz for the STT Group

Status Outline

- STT
- STS1 @ HADES (Phase 0)





STT Workpackage Status

Assigned WPs (funding by in-kind contracts)

1. Straws series & module production, integration, FoS readout (FZ Jülich)
2. Electronic readout system incl. data concentrator (AGH & JU Krakow)
3. Detector control & HV system & LV system (IFIN Bucharest)

Not assigned WPs, no funding (former EoI INFN)

4. STT mech. system: holding frame & cable routing cage
5. Gas system (EoI FZJ ??)
   - Option: design & production by CERN
6. Central Systems Frame structure (BP/MVD/STT) (EoI GSI)
   - New concept worked out by Stefan Koch & Jost Lühning

Further WPs (non-construction)

7. SW real-time: data processing, track&event association, ..
8. SW methods: calibration, tracking, PID

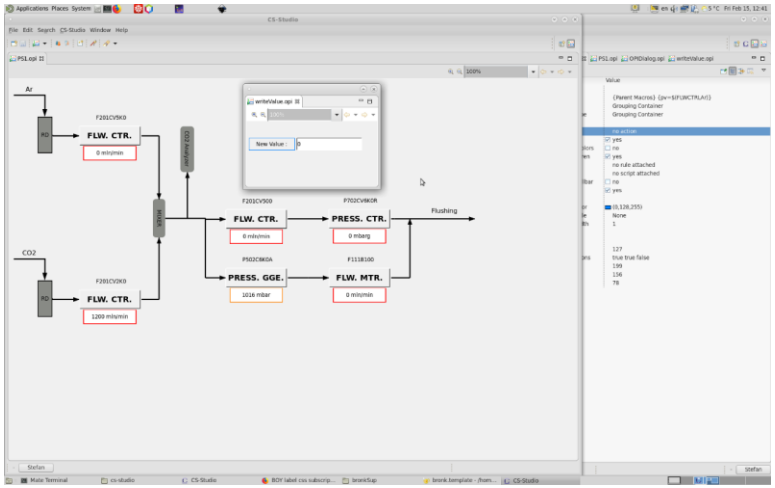
Phase-0 WP: STS1 @ HADES

STT Status & News

- In-kind contracts
  - WP ´electronic readout system´ final approval expected soon (PSP xx.3)
    - Assigned groups: AGH & JU Krakow (M. Idzik)
    - STT & FT electronic readout are combined
    - Important: ~ 200k EUR not covered (e.g. front-end layout, cooling)
  - Contract renewal for FZ Jülich submitted (PSP xx.1)
    - former contract was for period 2013-2018
  - Contract for IFIN Bucharest secured (PSP xx.4)

- Planning of final STT system assembly and installation → TEC session on Friday
  - Impacts from neighbouring systems (MVD, backEMC, CSF, ..)
  - STT system pre-assembly option to be discussed
  - (In-beam pre-commissioning at COSY?)

STT DCS Workpackage Status

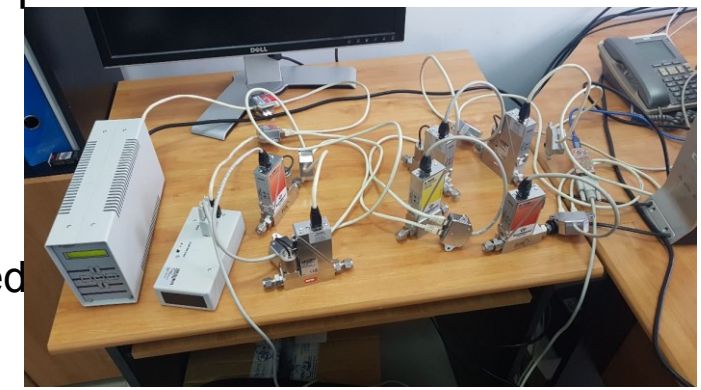


IFIN Bucharest

1. Detector control system
2. HV & LV system
3. Gas system interface to DCS

Status (report by Mario & Stefan Ghinescu)

- Generic gas system interface system was set up
  - one pressure controlled supply line
  - controllers set & read, meters read
  - 4 operation modes, alarm server
  - detailed scheme when WP gas system assigned



Current issue under discussion

- integration of electronic readout control/status in DCS (ASIC control via FPGA)
- ASIC/TRB DAQ system required in Bucharest, but no spare system available

STT Project Reporting To FAIR

MLS (Milestone Loaded Schedule)

- To be updated and harmonized, STT installation planned for 2024
- Open WP (STT mech. & gas system) to be included when assigned, now as risk factor

Project risk register

- Risk factors & mitigation, .. for (sub-) WPs, followed up continuously

FAIR CID (Component ID, FAIR-wide)

- Component declaration will be started, PANDA-STT: CID = 24 04 xx xxxxx
- List of components (xx) and device number (xxxxx) to be defined, but stay simple
- Important: CID declaration has consequences for
  - Procurement and logistics of components (e.g. storage, ..)
  - Safety and conformity for operation, maintenance and repair

Project progress score for STT

- 40% (Jan ´19), mainly by completion of straw series production and FoS readout system
- STS1 activities (phase 0) in 2017-19, not included in progress score

Current MLS

1.4.1.4.1

Component: Straw Tube Tracker [STT]
Owner: Peter Wintz
Editors: p.wintz@fz-juelich.de
a.belias
l.schmitt
u.kurilla
Progress score: Please, set your system's score!

Planning	Construction	Installation
M3: 01/03/2013	**ME2:** 30/06/2020	**M10:** 30/11/2023
ME1: 22/02/2019	**M8F:** –	**M11:** 08/03/2024
M4: 27/06/2019	**MX1:** 30/06/2020	**M12:** 06/09/2024
M7: 30/12/2019	**M8:** 28/09/2020	
	M9F: –	
	M9: 30/11/2022	

To be updated

Funding established and contracts signed not yet for all WPs

STT Upcoming Timemarks

- PASTTREC ASIC order asap when in-kind budget available
  - Final number of ASICs for STT & FT
  - Good news: extended production lifetime of AMS 0.35µm CMOS technology (> 2019)

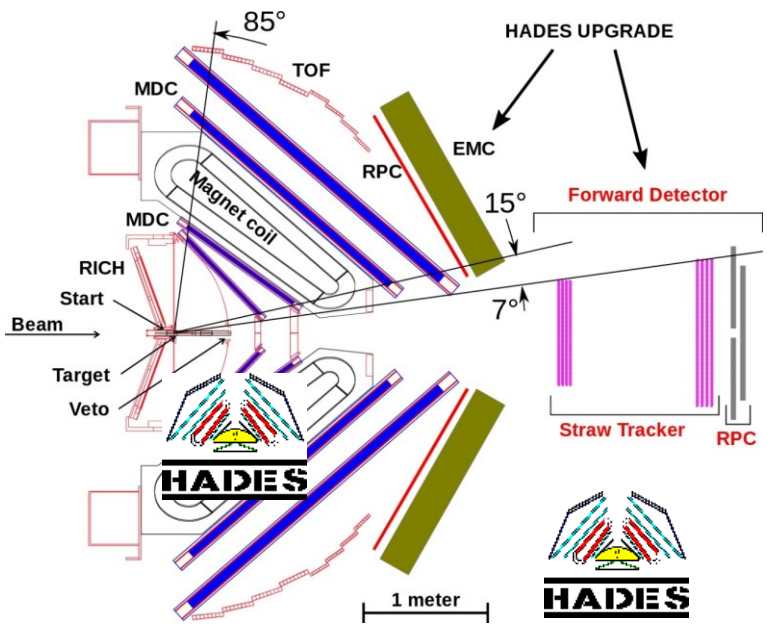
- Completion of phase 0 STS1 planned for Sep ´19 (mech. frame delay)
- Installation at HADES by end 2019
- Phase 0 experiments in period 2020-22

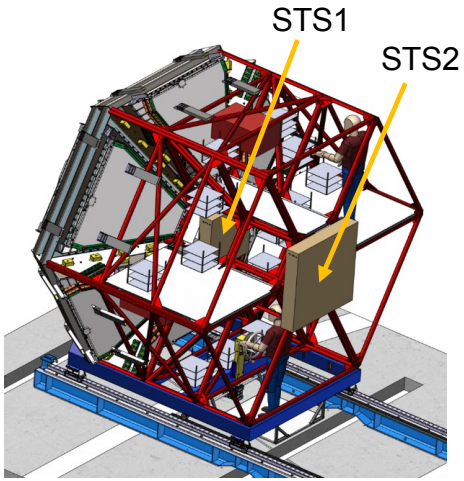
- STT straw module assembly planned to start in end 2019
- STT sector built-up in prototype mech. frame starting 2020
- Urgent: freeze of STT dimensions
  - STT/MVD integration required and agreement
  - STT dimensions: inner/outer radius, length, half-barrel gap size

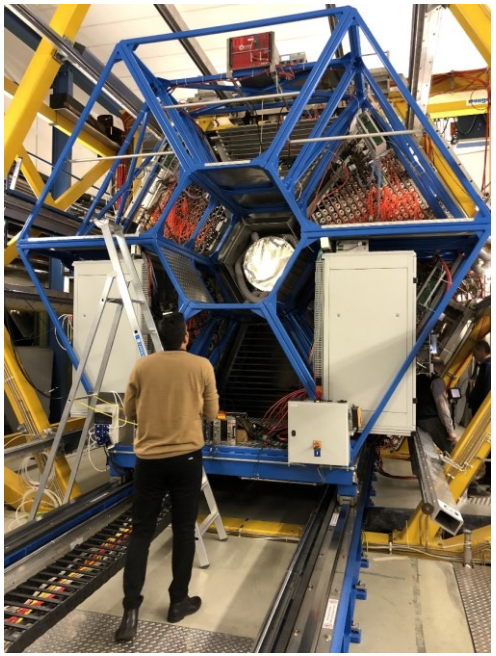
STS & HADES (Phase-0)

Reminder

- Experiment program: hyperon radiative and Dalitz decays with HADES at SIS18
- Upgrade by two forward straw tracker stations (STS1&2) for small polar angles $\theta < 7°$
  - STS1 by Julich STT group
  - STS2 by Krakow FT group
- Later use of STS1&2 modules in PANDA – FTS 3/4 and 5



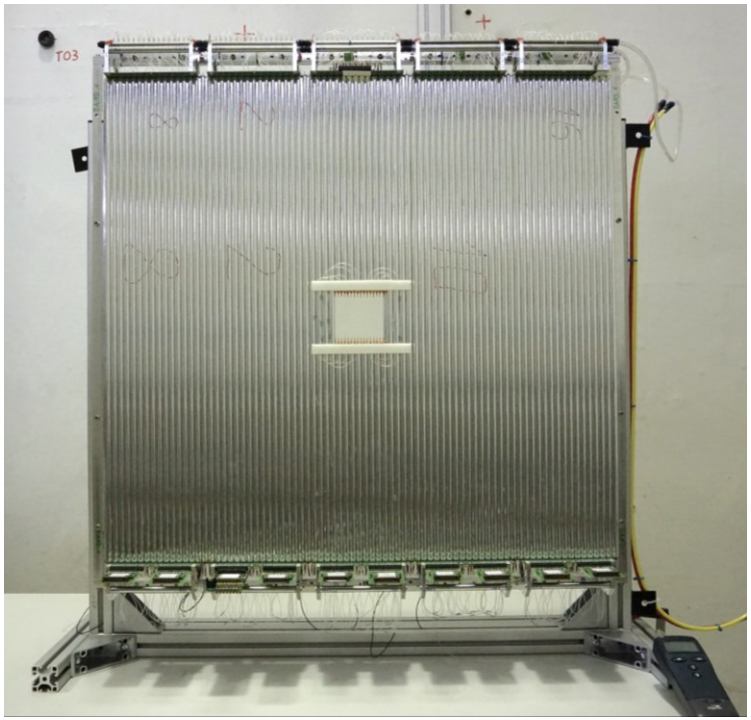




HADES upgrade by EMC, two forward straw tracker stations (STS1/2), RPC and DAQ..

STS1 @ HADES Status

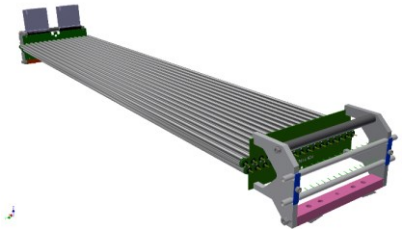
- STS1 modules
  - Straw length 766mm, 10mm straw diameter
  - 20 modules with 640 straws
  - 4 double-layers, orientations: 90°, 0°, 0°, 90°
  - 2x64 shorter straws for beam hole (~ 8x8 cm^2)
  - Ar/CO2 at 2 bar pressure (abs.)
- Use modules in PANDA FT3/4 after phase 0
  - specific STT → FT straw module design required



One STS1 double-layer

- FEBv3 front-end boards w/ PASTTREC-ASIC
- TRB3 readout (experiment HW trigger)

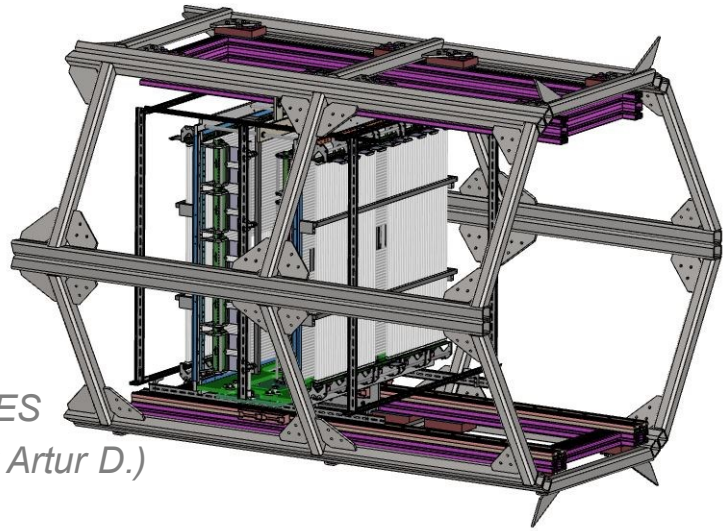
Compact FEBv3 (one FEBv1 added)



STS1 modules, 2x16 straws each

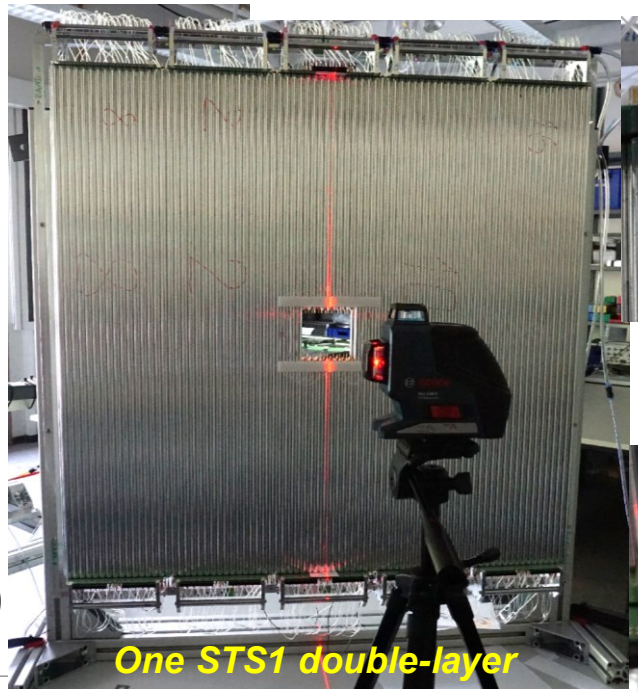
STS1 @ HADES Status

- Rails in HADES-ECAL frame installed (Orsay)
- STS1 support frame re-design (now in Julich)
- STS1 straw module mounting ongoing
- FEE and cabling ongoing
- DAQ set up next (TRB3)

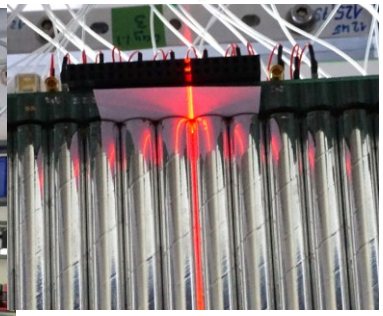


STS1 system in HADES ECAL-frame (CAD by Artur D.)

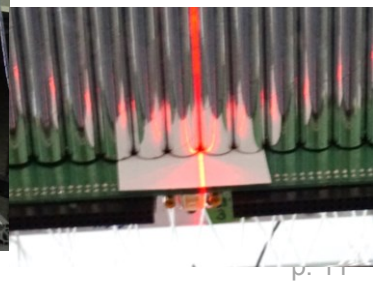
- Cosmic tests in Julich planned
  - Functional channel tests
  - Calibrations, thresh/BL tuning, ..
- Straw alignment
  - Laser beam & ^{90}Sr data



One STS1 double-layer



Module positioning with Laser beam



- Installation at HADES in Sep.´19
- Testbeam (~ h) possible in end ´19

Thank you

for

your attention