







WELCOME AND NEWS

Peter Wintz (IKP, FZ Jülich)

Tracking Session at CM 21/2

 Tuesday 15 Jun 2021, 16:30 → 18:30 Europe/Berlin

- | | | | |
|--------------|---------|--|---|
| 16:30 | → 16:35 | Welcome |  5m |
| 16:35 | → 16:55 | News and Status Updates
Speaker: Peter Wintz (Forschungszentrum Jülich) |  20m |
| 16:55 | → 17:15 | Development of System for Evaluation of FEB Quality for Straw Tube Readout
Speaker: Mirosław Firley (AGH University of Science and Technology(AGH)) |  20m |
| 17:15 | → 17:35 | Status of STS In-Beam Data Analysis
Speaker: Gabriela Perez Andrade (Forschungszentrum Jülich (FZJ)) |  20m |
| 17:35 | → 17:55 | PP Elastic Scattering Studies for Phase 0 at HADES
Speaker: Jana Tamara Rieger (Uppsala University (UU)) |  20m |
| 17:55 | → 18:15 | News from ADC Readout System
Speaker: Pawel Kulesa (IKP FZ Juelich) |  20m |

News and Updates



- Testbeams at COSY
- Phase 0 activities at HADES
- STT risk assessment

Testbeams at COSY



Quest: Mid-term Plans

- Planned operation of COSY accelerator till 2024
- Beam weeks per year restricted
- COSY beamtime advisory committee CBAC evaluates beam requests
- Beam request coordinator: Frank Goldenbaum
- Experiment groups are asked to inform about mid-term plans (- 2024)
- Tentative beamtime interest for PANDA-STT tests:

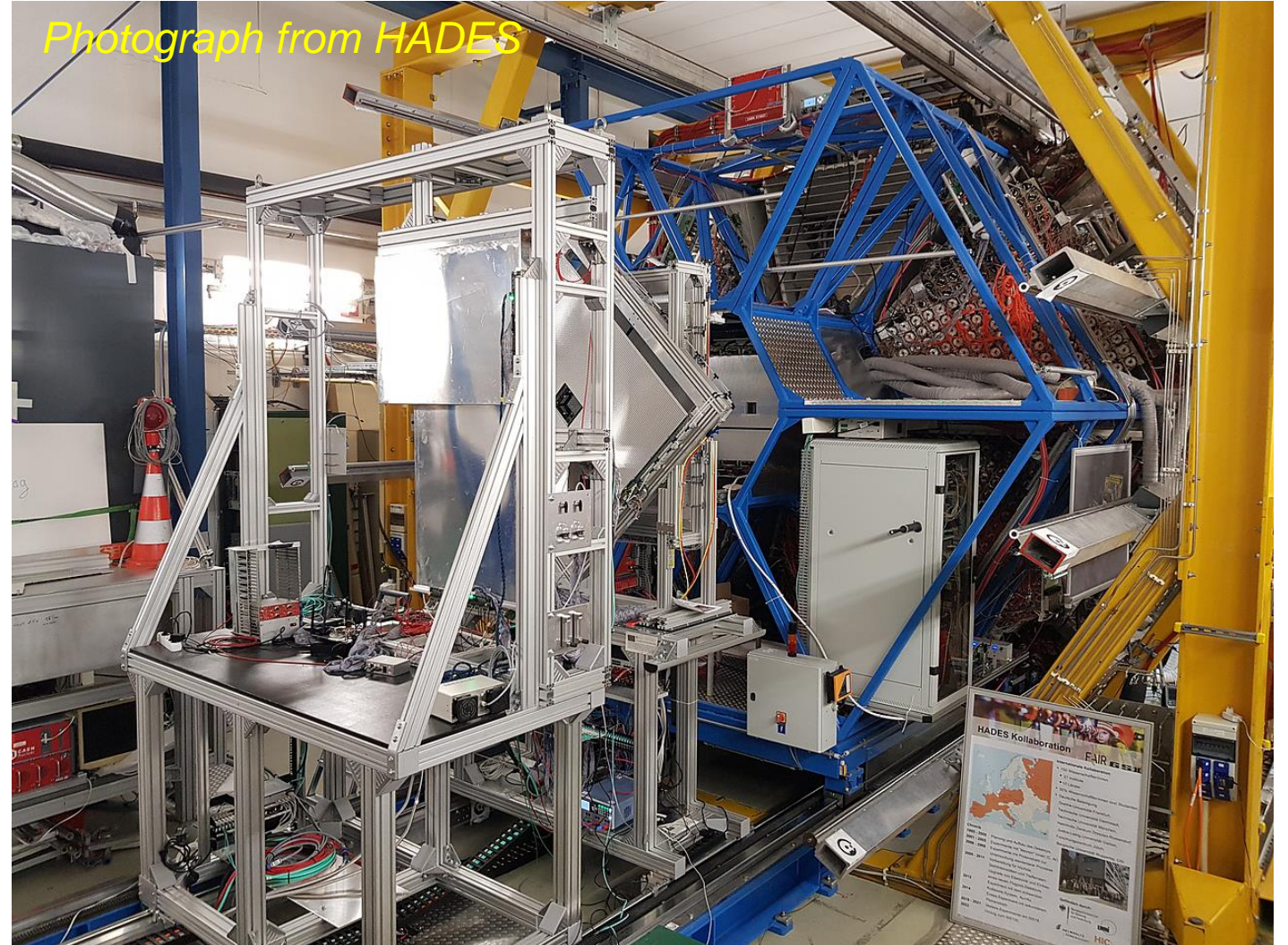
Year	Weeks	Experimental program	Important outcome
Q3-Q4 /2023	1+1	STT in-beam system tests	Various tests of components (mech. system, electronic readout, SW developments: calibration, tracking, ..)
Q3-Q4 /2024	1+2	STT pre-assembly and in-beam pre-commissioning	PANDA-STT FAIR-M9, site acceptance test

Phase 0 Activities at HADES

Feb. 2021 Commissioning Beam Time

- Forward detectors installed
 - STS1 ($z \sim 3.5$ m)
 - STS2 ($z \sim 5.5$ m)
 - fRPC two sectors (tof, $z \sim 6.5$ m)
 - readout included in HADES-DAQ
- Proton beam, 4.2 GeV (and 2 GeV)
- No failures, rich data basis
- Data analysis ongoing → *Gabriela P.*
- PP elastic scattering simulation

→ *Jana R.*



Phase 0 Activities at HADES

Feb. 2022 Experiment Beam Time

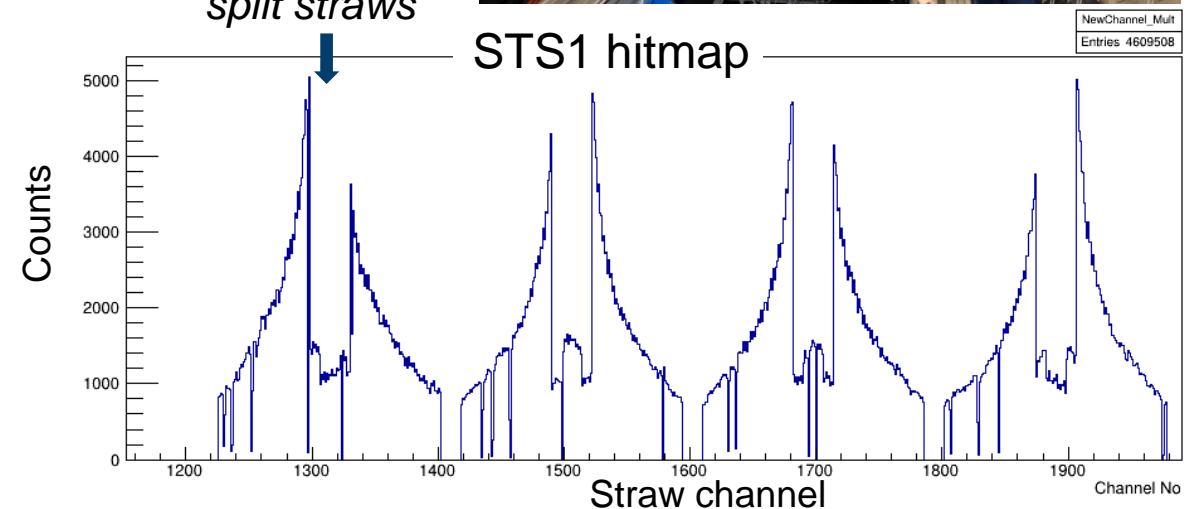
- Four weeks scheduled
 - Feb 7th – Mar 8th (tentative)
 - Proton beam, 4.5 GeV
 - I_{H_2} target
- Preparatory work to do (STS1 specific)
 - STS1 maintenance
 - exchange FEBs with failures (see hitmap) by new boards
 - reorganize few signal cables (LVDS) at TRB3 boards
 - Alignment of STS1, STS2, fRPC in HADES
 - Helium bag between STS1 and STS2 (?)
- System tests with running DAQ in Q4/2021



Beamhole,
split straws



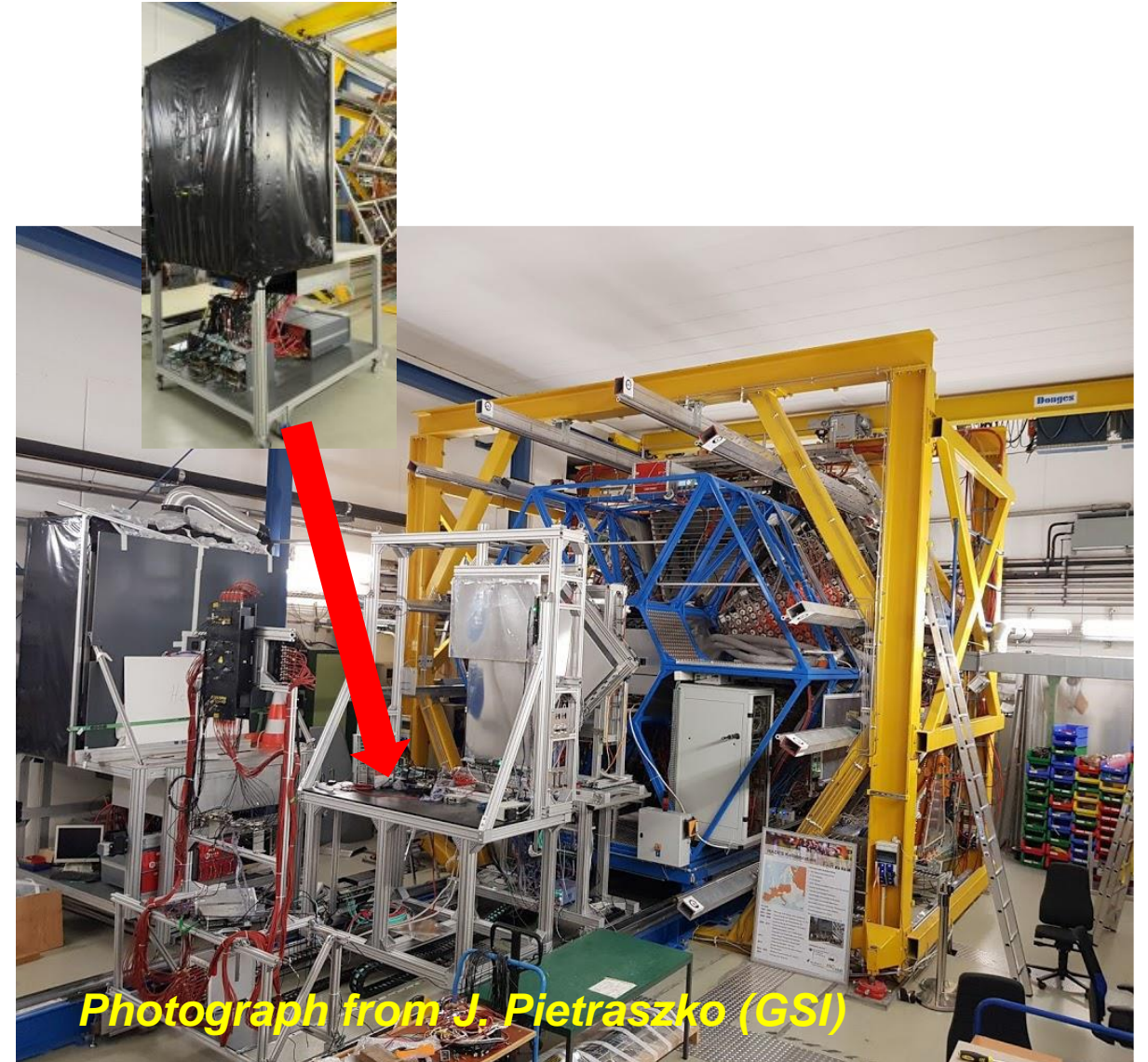
STS1 installed in HADES



Phase 0 Activities at HADES

In Apr/May 2022 Next Experiment with Ion Beam

- Au ion beam on Au target
- Apr / May 2022, 1+1 week (tentative)
- STS1, STS2, fRPC to be removed from HADES (material budget reason)
- Forward wall detector to be installed
- New target - beam line setup
- Only few weeks (3 ?) between beamtimes for maintenance
- High activity time period Q4/2021 – Q2/2022



STT Risk Assessment



(Draft, Discussion in TB)

- Identify risks for STT system & components (failure, damage, loss of functionality, ..)
- Risk of personal injury
- STT specific issues (fragile components, thin foils, high voltage, and electric power, clean gas, clean environment, ..)
- 31 risk items
- Risk value for each item
- Mitigation actions to lower risk values

Risk ID	Description of Risk (orientating to the hazard)	Life cycle	Possible consequences	Probability of occurrence	Impact	Risk Value	Risk Mitigation	Post-Mitigation Probability of occurrence	Post-Mitigation Impact	Post-Mitigation Risk Value	Comments/References to the Documents
TECHNICAL RISKS											
Mechanical Hazards											
RL-001	1 Excessive gas over-pressure inside straws	Regular use	Leakage at or burst of straw tubes or gas pipings, loss of equipment and functionality	2	4	3	Gas pressure and mass flow control system with alarm circuits, mass flow and over-pressure limits, follow handling and instruction manual, operation only by qualified personnel	1	2	1	Instruction manual and personnel training will be prepared
	2 Gas under-pressure inside straws	All	Damage to straw tubes, loss of equipment and functionality	2	3	2	Follow handling and instruction manual, operation only by qualified personnel. Opened in- and outlets if not connected to gas supply with pressure control.	1	2	1	Instruction manual and personnel training will be prepared
	3 Pollution inside straws (traces of lubricants, oil, water, dirt, etc..)	Regular use	Damage to straw tubes or excessive aging, loss of equipment and functionality	2	4	3	System control, access and operation only by qualified personnel	1	3	2	Instruction manual and personnel training will be prepared
	3 Excessive pressure of cooling gas	Regular use	Damage to straw tubes or electronic components, loss of equipment and functionality	2	3	2	Pressure control with over-pressure limit, follow handling and instruction manual, operation only by qualified personnel	1	2	1	Instruction manual and personnel training will be prepared
	4 Pollution of cooling gas medium (traces of oil, water, dirt, etc..)	Regular use	Damage to straw tubes or electronic components, loss of equipment and functionality	2	3	2	System control and operation only by qualified personnel	1	2	1	Instruction manual and personnel training will be prepared
	5 Weight load on system, improper lifting or mounting of system and fragile components	All	Damage of mechanical system, straw tubes, cables or electronic components, loss of equipment and functionality. Personnel injury.	2	4	3	Follow handling and instruction manual, operation only by qualified personnel. Personnel protection by helmet and safety shoes.	1	3	2	Instruction manual and personnel training will be prepared
	6 Weight load on fragile straw modules and components	All	Damage to straw tubes, loss of equipment and functionality.	2	3	2	Follow handling and instruction manual, operation only by qualified personnel	1	2	1	Instruction manual and personnel training will be prepared
	7 Bending of straw or straw modules	All	Damage to straw tubes, loss of equipment and functionality.	2	3	2	Follow handling and instruction manual, assemblies and operation only by qualified personnel	1	3	2	Instruction manual and personnel training will be prepared
	8 Improper storage or packaging of fragile components	Transport, storage	Loss of equipment and functionality.	2	3	2	Clear labeling of storage and packaging boxes. Follow handling and instruction manual.	1	2	1	Contents labeling and instruction manual.
Electrical Hazards											
RL-007	9 Excessive high voltage or excessive ionisation currents inside straws	Regular use	Loss of equipment and functionality. Increased straw aging. Straw damage by sparking may occur	2	3	2	Control and limits for maximum high voltage and current. Limit on maximum current flow and fast kill circuitry. Operation by qualified personnel.	1	2	1	Instruction manual and personnel training will be prepared
	10 High voltage corona discharge or arcing (e.g. coupling capacitors)	Regular use	Straw damage and/or loss of functionality of straws in same high voltage sector or module	3	4	4	Assemblies, operation only by qualified personnel	2	3	2	Instruction manual and personnel training will be prepared
	11 Short circuit by broken wire inside straw	Regular use	Straw damage and/or loss of functionality of straws in same high voltage sector	3	3	3	Assemblies and control only by qualified personnel. Follow quality assurance instructions.	2	3	2	Instruction manual and personnel training will be prepared
	12 High voltage corona discharge or arcing (e.g. coupling capacitors)	Regular use	Burning of electronic board components. Loss of equipment and functionality.	2	3	2	Dry and clean environment, high voltage current limit and control, humidity sensor and control.	1	2	1	Instruction manual and personnel training will be prepared
	13 Power cable insulation damage	Regular use	Loss of equipment and functionality, electrical shock, fire, personnel injury	2	2	1	Regular inspection of cables. Control of electric power and upper current limits.	1	2	1	Instruction manual and personnel training will be prepared
	14 Insufficient cooling of front-end electronics	Regular use	Loss of equipment and functionality, burning of electronic board components	2	2	1	Temperature measurement and implementation in detector control system	1	2	1	Instruction manual and personnel training will be prepared
	15 Improper storage or packaging of electronics, cables and components	Transport, storage	Loss of equipment and functionality, burning of electronic components later by short circuits	3	2	2	Clear labeling of storage and packaging boxes. Follow handling and instruction manual.	2	1	1	Contents labeling and instruction manual.
	16 Contact to components on high voltage	Regular use	Personnel injury by electric shock	2	3	2	Protection or coverage of high voltage electric contacts. Limited current flow and fast kill circuitry. Instruction and clear labeling of components. Access only by qualified personnel.	1	1	1	Instruction manual and personnel training will be prepared
	17 Contact to components with high electric power	Regular use	Personnel injury by electric shock	2	3	2	Protection and coverage of high power electronic contacts. Instruction and clear labeling of components. Access only by qualified personnel.	1	2	1	Instruction manual and personnel training will be prepared
Environment Hazards											
RL-013	18 Excessive gas leakage and accumulation of argon	Regular use	Personnel injury, from headache, dizziness, up to oxygen deficit and suffocation danger in case of large quantities and accumulation at ground	2	3	2	Gas mass flow control and alarm circuits, regular leakage tests, oxygen sensor at TS. Air exchange in work rooms.	1	3	2	Instruction manual and personnel training will be prepared
	19 Excessive gas leakage and high concentration of CO2	Regular use	Personnel injury, from heavy breath-taking to danger of fainting in case of room concentrations above 0.5% and 3-5%.	2	2	1	Gas mass flow control and alarm circuits, regular leakage tests, CO2 sensor and air exchange in work rooms. (< 1000 l/day, < 2% CO2 conc. in 50m^3 room)	1	2	1	Instruction manual and personnel training will be prepared
	20 Gas outlet line not connected to official exhaust line, but left open in work room	Regular use	Personnel injury see above	2	3	2	Access to gas supply system and lines only by qualified personnel. (Estimate < 1000 l/day, < 2% CO2 conc. in 50m^3 room)	1	2	1	Instruction manual and personnel training will be prepared
	21 Exposure of detector components to water, high humidity, oil vapours, etc.	Transport, storage and regular use	Loss of equipment and functionality.	2	4	3	Clean environment and control, prevention of water incidents, protection covers.	2	3	2	Instruction manual and personnel training will be prepared
	22 Electrostatic discharges by contact to high power electronic components	Regular use	Personnel injury, short electrostatic shock	2	2	1	Common electrostatic grounding and insulation scheme in work room	1	1	1	Instruction manual and personnel training will be prepared
Thermal Hazards											
23	Exposure to excessive temperatures	Transport, storage and regular use	Damage to detector materials, loss of equipment and functionality	2	2	1	Environment control, operation by qualified personnel.	1	2	1	Contents labeling and instruction manual.
Fire Hazards											
24	Fire accident in environment of system or components	All	Personnel injury by getting in contact with smoke or toxic vapours. Loss of equipment and functionality.	2	4	3	Fire and smoke detectors and fire extinguishing systems in environment. Covered detector volumes and intrinsic protection by argon and CO2 detector gas.	1	3	2	Personnel instruction and training
Ergonomic Hazards											
25	Heavy system components can crush and harm equipment and personnel	Assemblies and installation	Personnel injury, loss of equipment functionality	2	4	3	Follow handling and installation instructions, wear safety helmets and safety shoes, operation only by qualified personnel	1	3	2	
26	Lack of workplace space during installation, danger of crushing, stumbling and falling	Assemblies and installation	Personnel injury, loss of equipment functionality	2	4	3	Operation only by qualified and trained personnel, coordination of installation	1	3	2	
27	Lack of qualified personnel during installation, danger of crushing, stumbling and falling	Assemblies and installation	Personnel injury, loss of equipment functionality	2	4	3	Operation only by qualified and trained personnel	1	3	2	
28	Electrical blackout - danger of system crashing during installation, danger of personnel falling or stumbling	Assemblies and installation	Personnel injury, loss of equipment functionality	2	4	3	Follow handling and installation instructions, wear safety helmets and safety shoes, operation only by qualified personnel	1	3	2	
Radiation Hazards											
29	Radioactive activation of detector components	Maintenance	Personnel injury by radiation dose	2	3	2	Follow radiation protection safety rules, check for radiation after dismounting, access only by qualified personnel. Warning signs.	1	2	1	
30	Improper handling of radioactive sources	Regular use	Personnel injury by radiation dose	2	3	2	Follow radiation protection safety rules, access only by qualified personnel. Warning signs.	1	2	1	
31	Laser radiation	Regular use	Personnel injury - damage to eyesight	2	3	2	Follow laser protection safety rules, wear appropriate protective glasses, avoid light scattering, warning signs. Use class 2 lasers.	1	2	1	