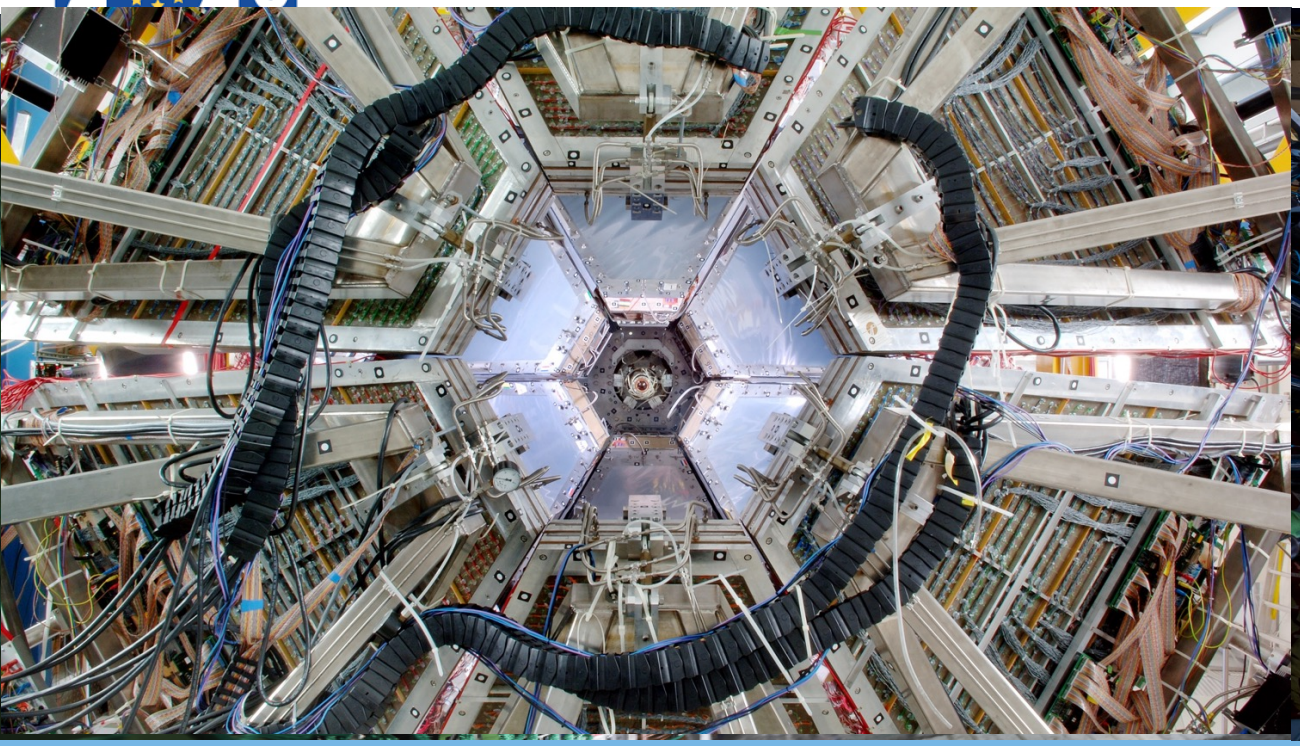
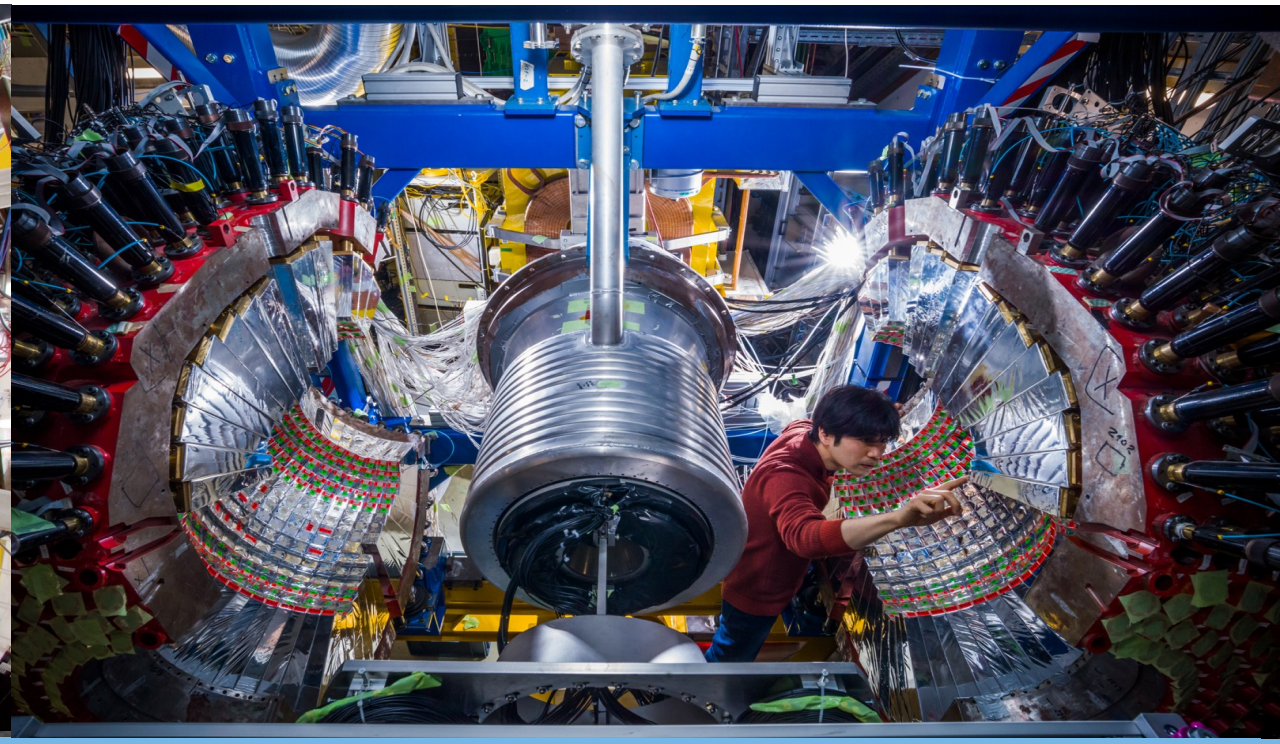




Transnational Access to GSI

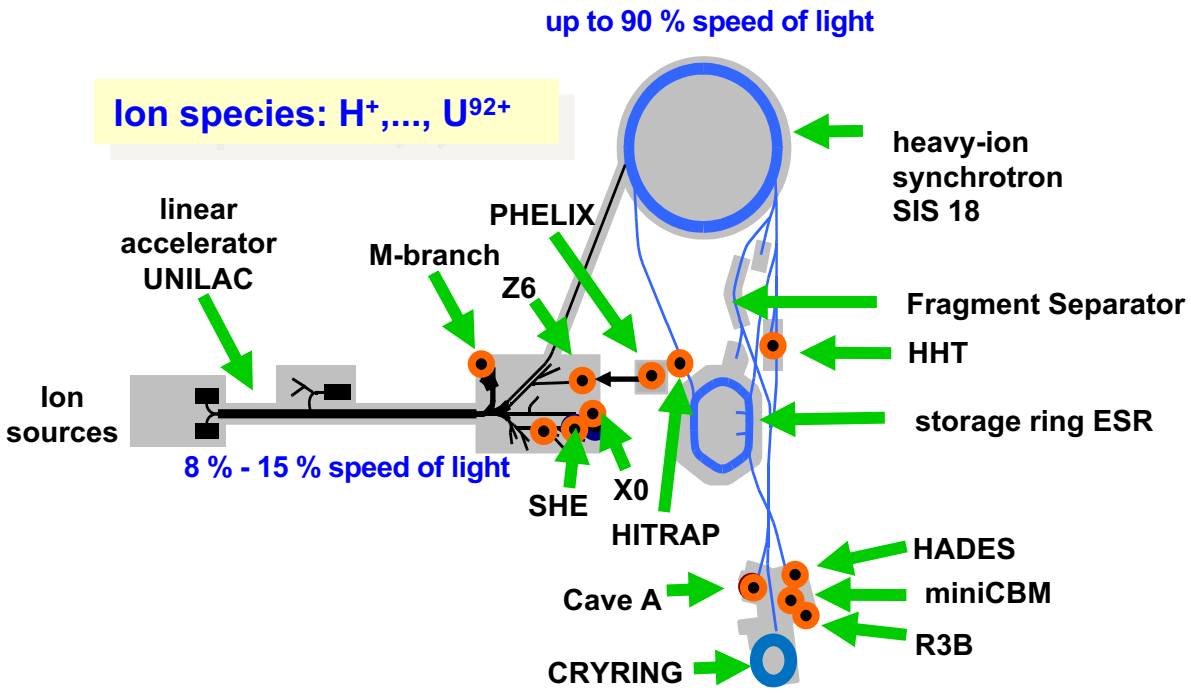
Yvonne Leifels

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824093

GSI – Science while realizing FAIR

Strong response of scientific community, more than 1500 scientists involved, demand largely exceeding the available beam time, confirming the attractiveness of the experimental opportunities

- beam time 2022 lasted from February 2nd to June 30th, a total of 116 days of user beamtime have been provided
- beam time has been performed as planned; two experiments could not be fully served
- beam times in 2023/24 were assigned in a G-PAC Meeting in September 2022



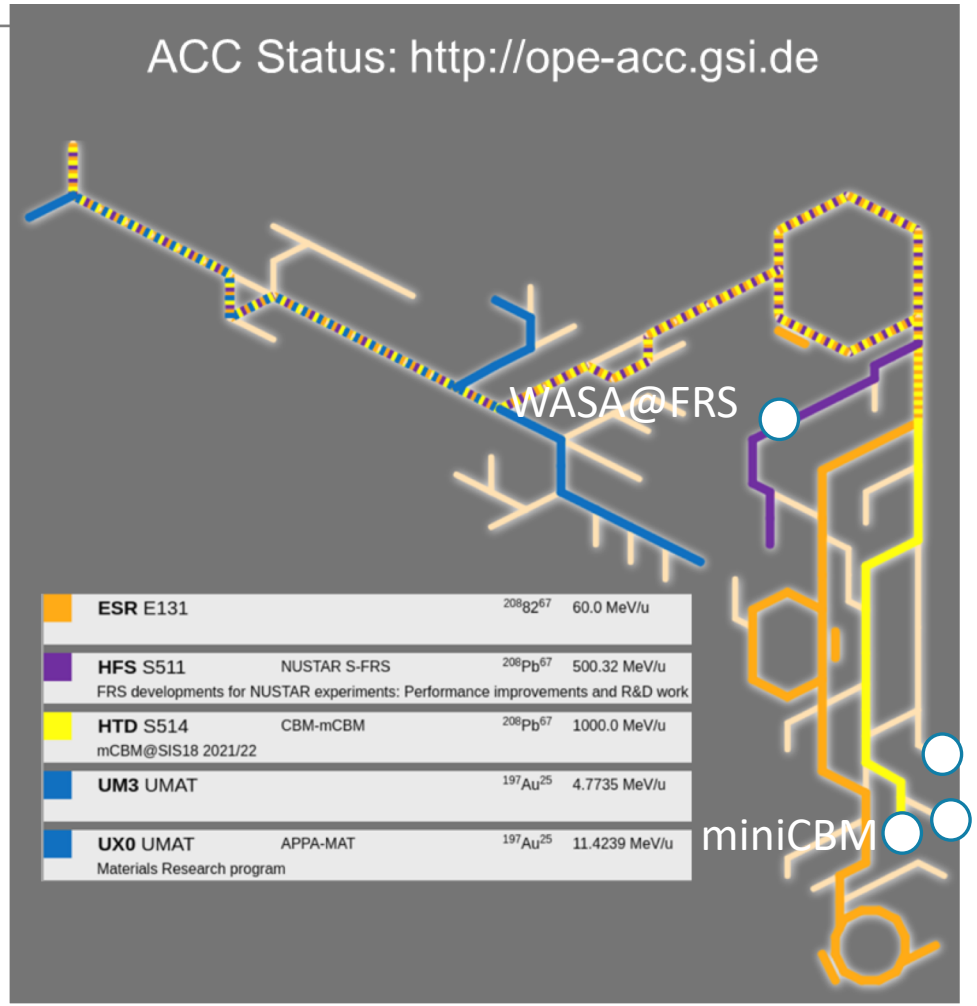
Beam time 2022

General remarks

- 2nd run under COVID restrictions
- 1st run during the Russian invasion in Ukraine
- long delivery times of specific materials
- rising costs for energy and materials
  - electricity costs higher ~70-80%

Accelerator progress

- Operation of 3 parallel beams including U, with overall parallel factor 2.3
- Long CH^{3+} run with optimum performance
- Booster mode for SIS18 established
- Operation parameters of pulsed hydrogen gas-stripper verified

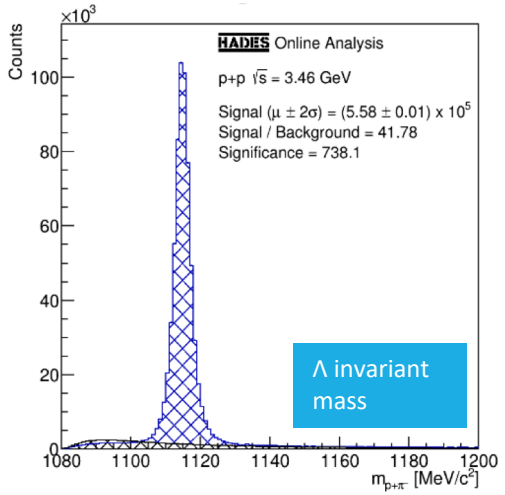


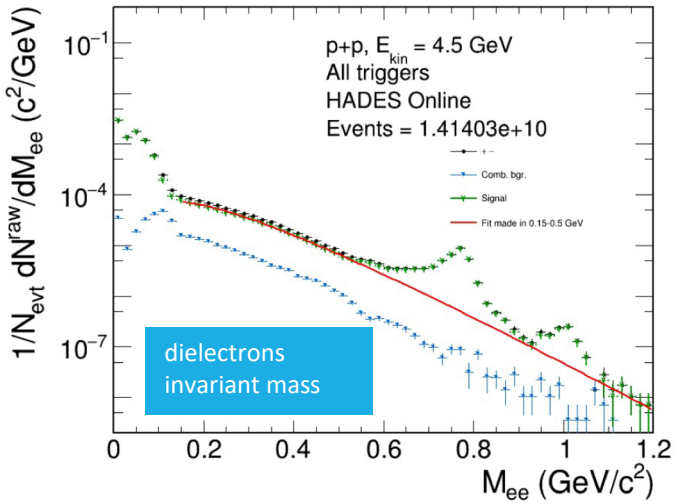
HADES p+p@4.5 GeV

Production and decay of strange resonances: eTFF's Λ, Σ
PANDA Forward Tracker →HADES Straw tube tracker for improved **HYPERON** acceptance in forward direction

- Complete installation in Nov. 2021 for beam time 2022
- Collected statistics might not be sufficient for all anticipated physics goals

online

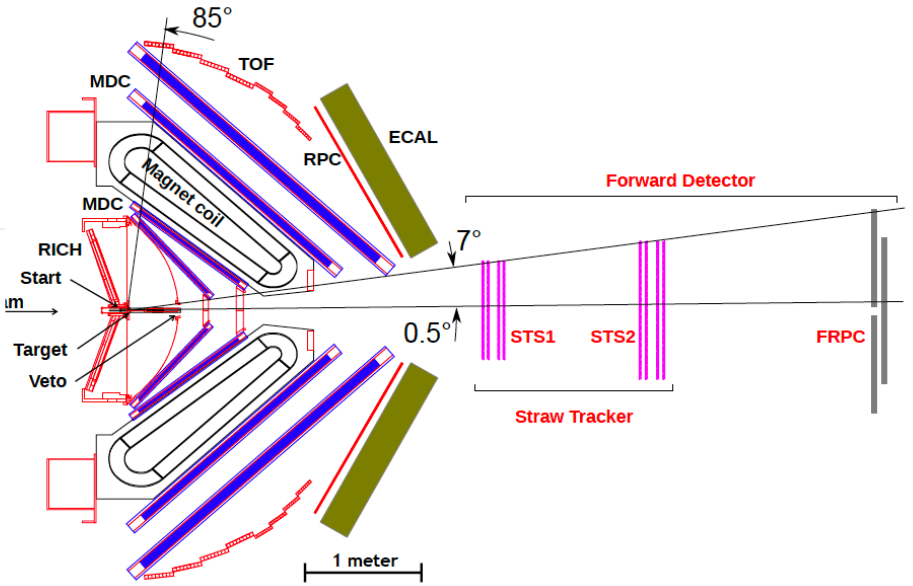


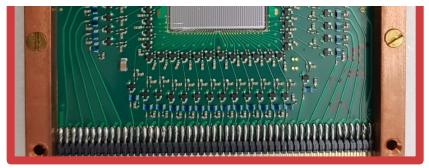


STS2 *Jagiellonian Univ.*

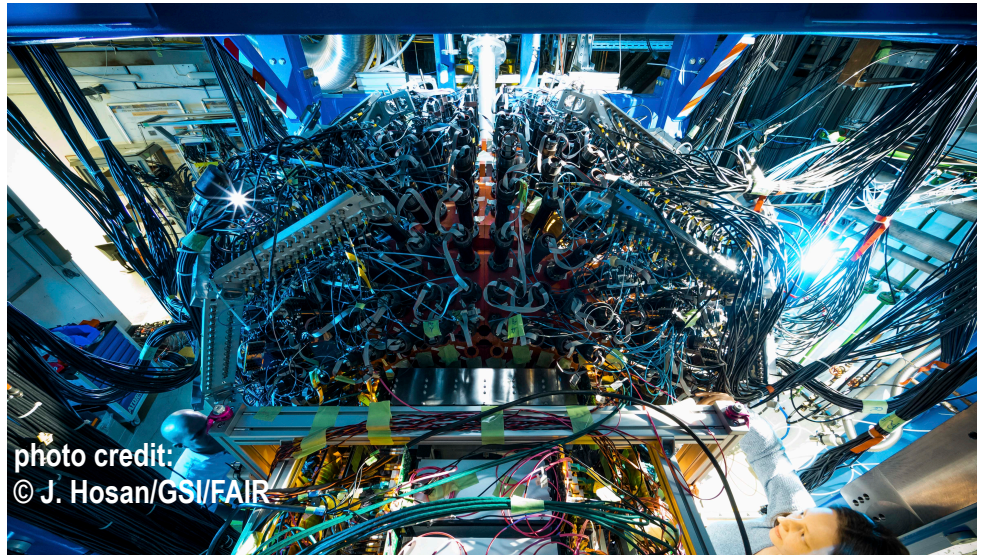
STS1 *TransFAIR, Jülich*

Forward RPC *LIP Coimbra*





WASA@FRS



WASA detector:

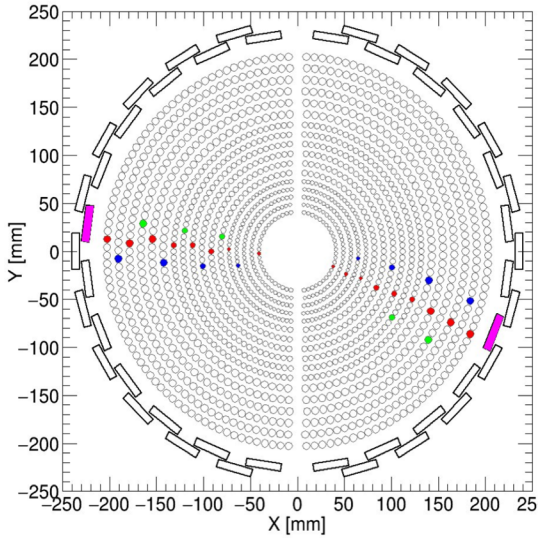
- 18 tons of weight
- s.c. solenoid magnet (700 A, 1.0 Tesla)
- ~10.000 electronic channels
- installation work: July 2021 – January 2022

Data stream:

- up to 300 MB/second
- 50 TB recorded in 1 week of beamtime

Main detectors:

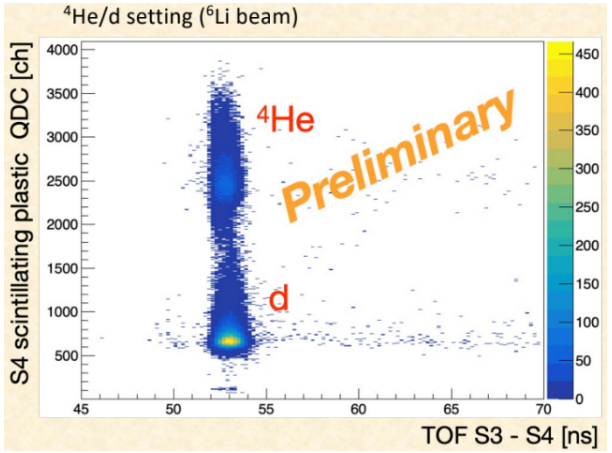
- Scintillator barrel
- Mini Drift chambers
- CsJ calorimeter
- Fiber tracking detectors



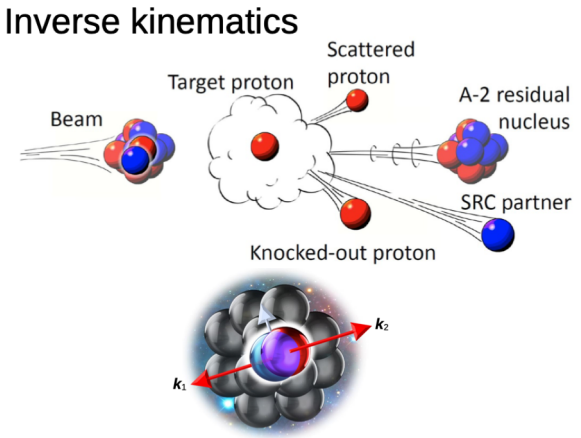
- Novel spectroscopic techniques are explored to
- study exotic nuclei and exotic atoms
- For the first time a calorimeter is coupled to a high-resolution spectrometer for relativistic beams

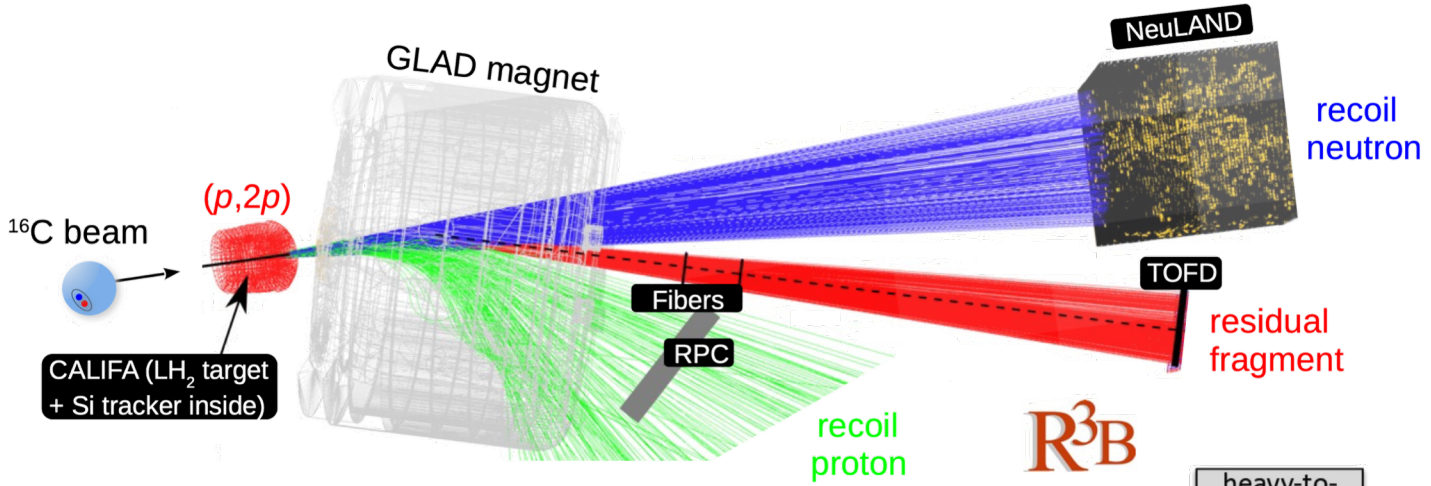
Experiments:

- Search for eta'-mesic nuclei (S490, K. Itahashi et al., 22.-28. February)
- Hypernuclei spectroscopy (S447, T. Saito et al., 10.-19. March)
- Characteristics of baryonic resonances (J. Benliure, could not be performed)



Short-range correlations in exotic nuclei





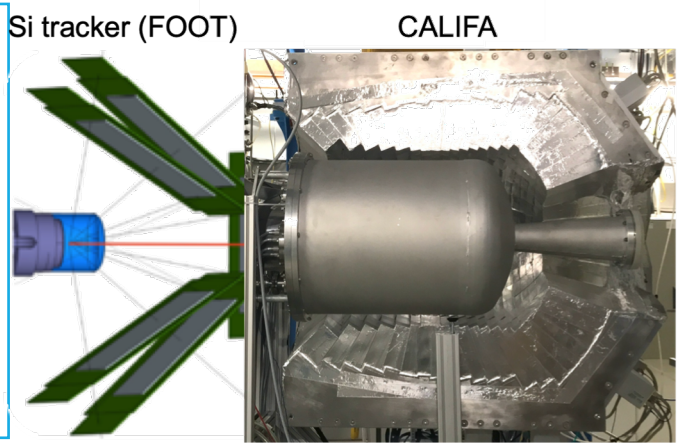
JLAB (e+A) conclusion: Protons more correlated in neutron-rich, stable nuclei

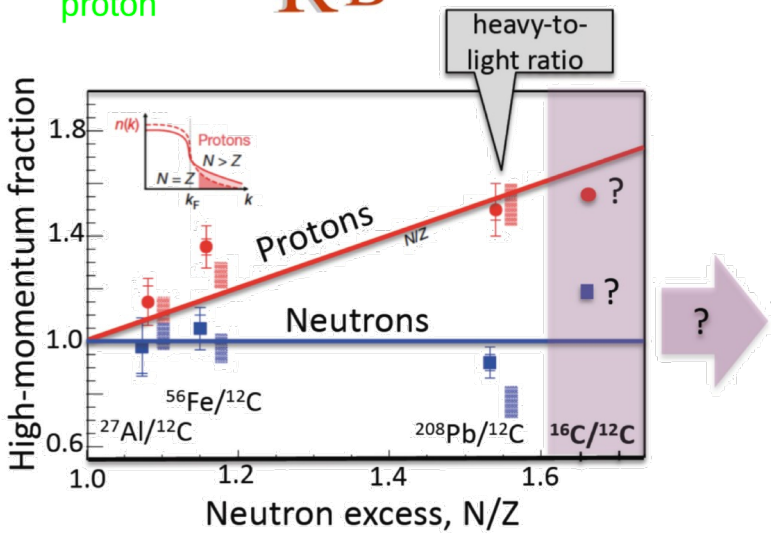
Open questions

- effect of mass ratio or asymmetry?
- development towards large N/Z

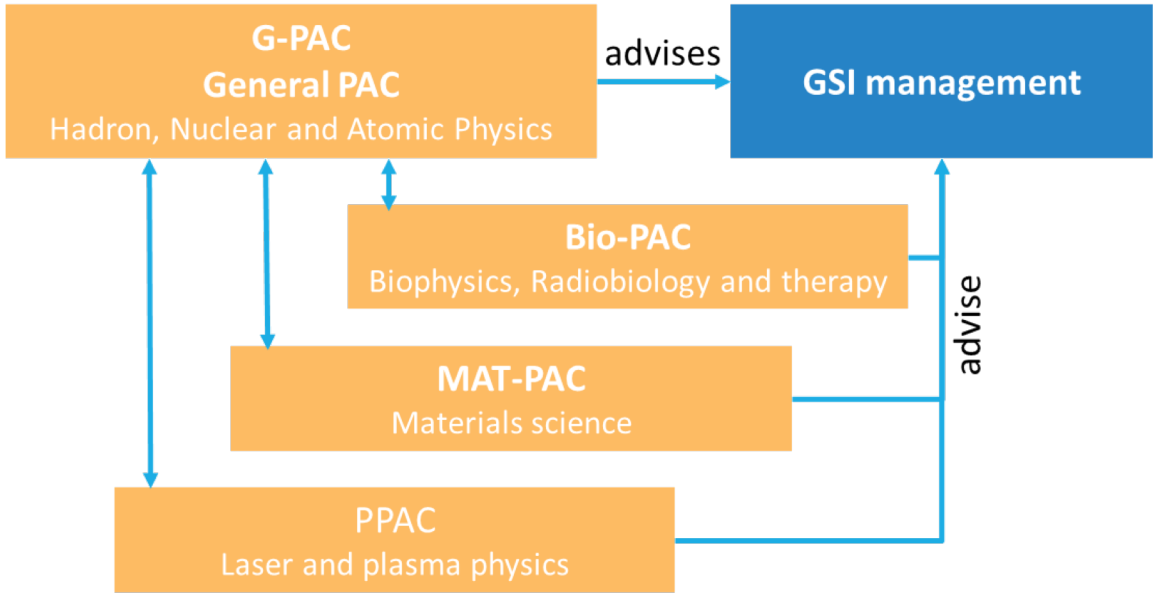
FAIR Phase-0 experiment at R3B

- changing N/Z at similar mass
- kinematically complete measurement using ^{12}C, ^{16}C beams
- A. Corsi et al.





General Program Advisory Committee G-PAC



Organization:

Sub-PAC Chairs report to G-PAC;
PACs recommend granting beam time to the directorate

G-PAC met on September 28th - 30th

- Evaluated 59 proposals asking for more than 2700 shifts
- Request 1832 shifts* for SIS18 operation
- Beam time 2023/24
  - allocation of 744 shifts for SIS18 operation for hadron, nuclear and atomic physics experiments
- Approved STRONG-2020 experiments:193 shifts
  - heavy ion reactions
  - hadron physics
- Next user selection panel meeting will take place in December 2022

*1 shift = 8 hours

Actual quantity of access provided

As reported in the Periodic Report 2 with numbers from end of April:

- many travel cost requests have not been processed due to lack of man power in the relevant department
- accounting of beamtime (BOT) has not been finalized

	Estimated / delivered **hours of beam time**	**Estimated / supported number of days spent in infrastructure**	**T&S / Euro**
Month 1-18	500 / 0	660 / 0	
Month 30-36	900 / **860**	800 / **409**	**52.436 Euro**
Month 1-54	1450 / 860	1760	165.0000

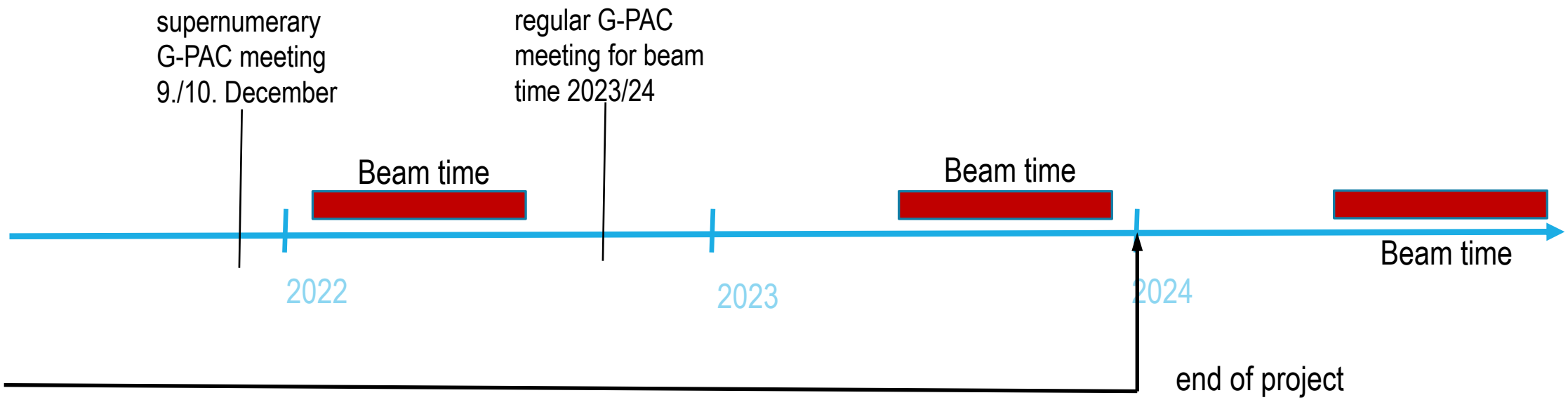
Actual quantity of access provided

Current status

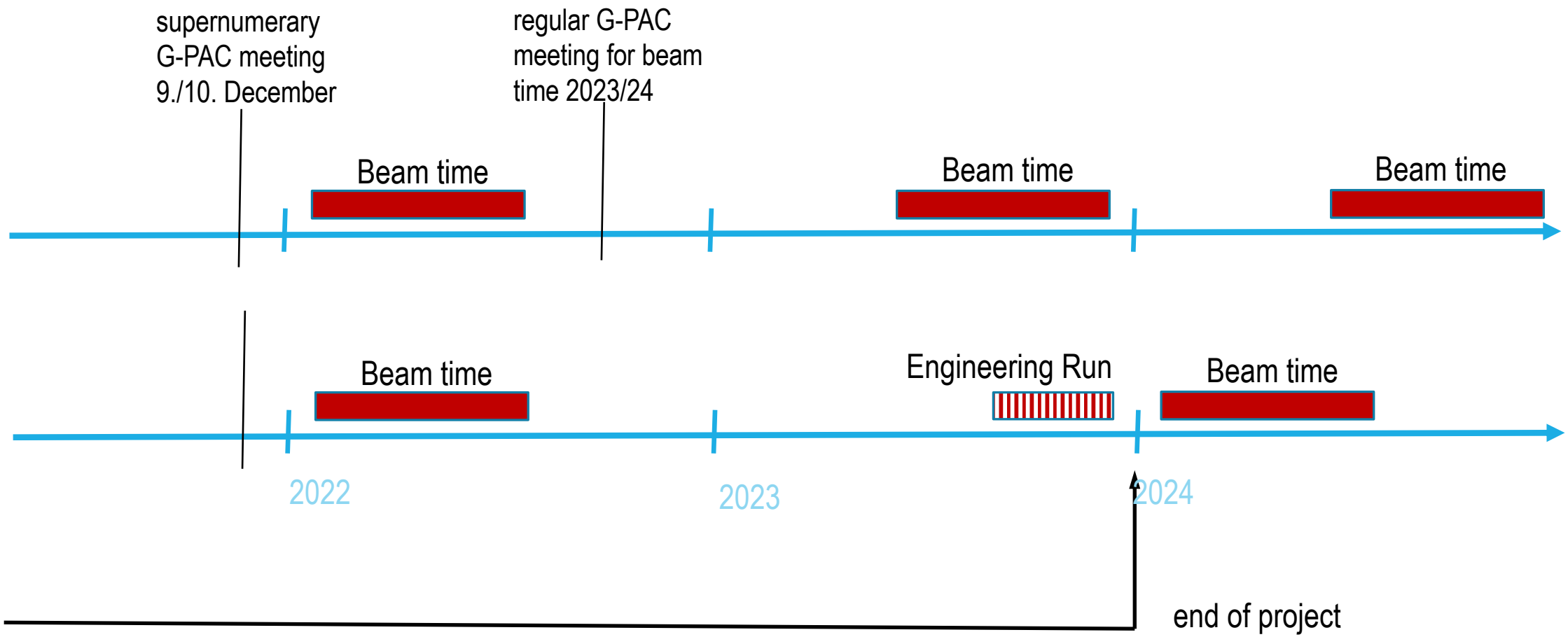
- not all travel cost requests have been processed
- accounting of beamtime has been finalized

	Estimated / delivered hours of beam time	Estimated / supported number of days spent in infrastructure
Month 1-18	500 / 0	660 / 0
Month 30-36	900 / **1025**	800 / **710**
Month 1-54	1450	1760

Outlook 2022 / 23



Outlook 2023 / 24



Summary and Conclusions

Outlook

Rising costs for electricity/gas and consequently rising costs for materials (and personnel) led to a difficult financial situation:

- reduction of the beamtime in 2023-25 despite the fact that the beamtime is already overbooked
- working group evaluating different scenarios
- shift of beamtime 2023 to 2024
- in addition to other saving measures....

Conclusion

Facing the current situation GSI will not be able to provide enough beam time for TA

Another project prolongation would certainly help but is a matter of discussion