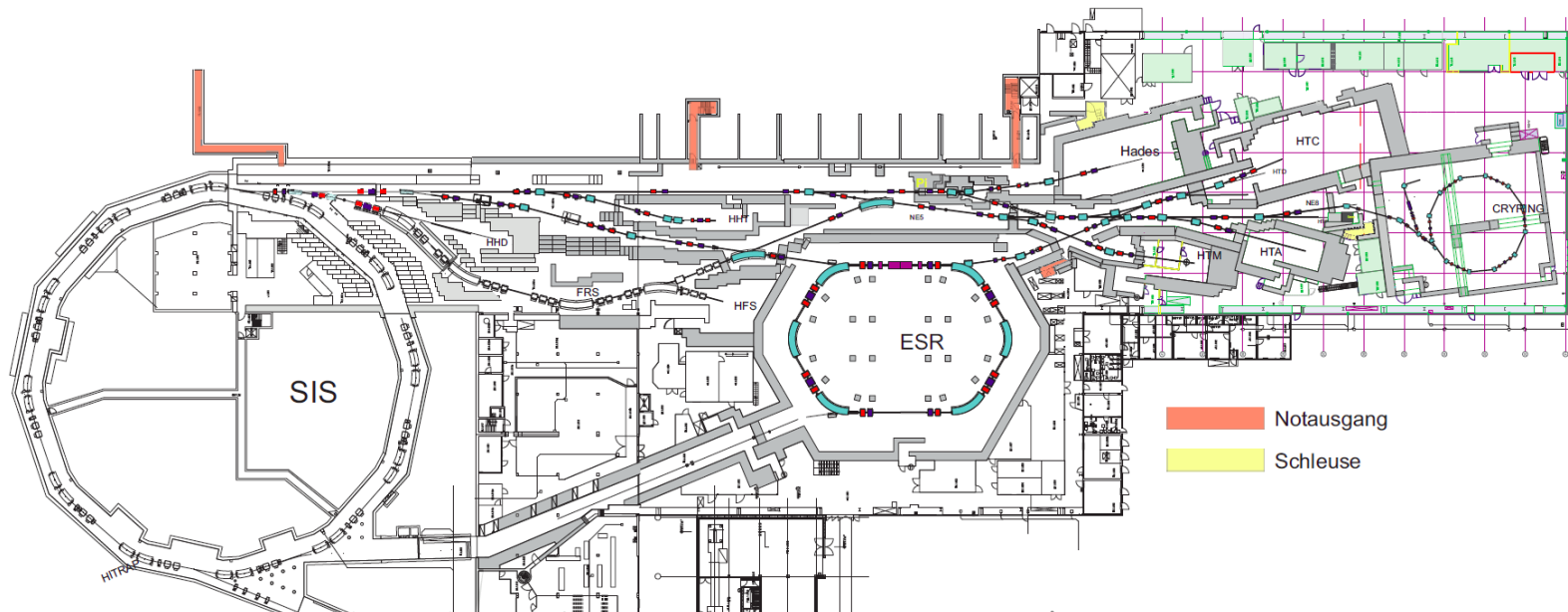


HEST status and commissioning plans

M. Sapinski
GSI Beam Time Retreat
February 23, 2018



- About 500 meters of beam lines, ~140 magnets
- From SIS18 to Cave A, C, M, ESR, HADES, CryRing, HFS, HTD, HHT and beam dump (HHD)
- From ESR to Cave C, Cryring

MK: M. Sapinski
 STV: P. Schuett
 deputy for both:
 S. Reimann

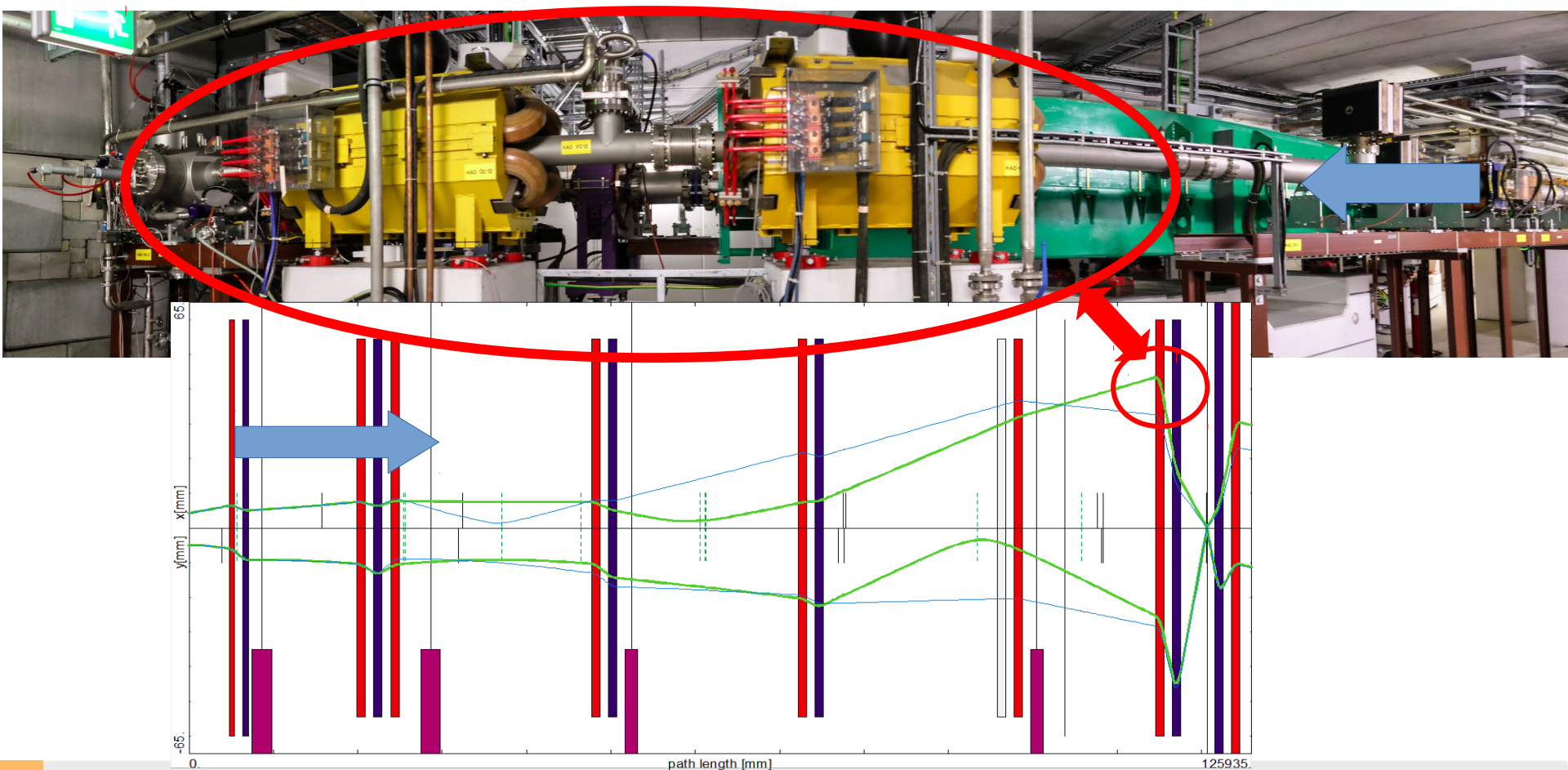
- HADES beamline:
 - Increase of the **vacuum chamber apertures** to accommodate optics with higher beta function before focusing on target
 - **Instrumentation**: Beam Loss Monitors, **halo monitors** and SEM foils for intensity measurements
(see presentation of M. Schwickert yesterday)
 - Remark: there will be no high-intensity beam in 2018 and 2019 (PAC decision December 2017) – some of these measures will be needed only in 2020, but are being implemented now.
- mCBM – see presentation C. Sturm after lunch
- Vacuum – pressure gauges maintenance and upgrade, upgrade of ion getter pump controllers,, exchange of roughing pumps, modifications to HADES beamline (due to new vacuum chambers).

On track for 2018 beam time (mCBM vacuum chamber delayed)

Hardware changes - examples

HADES beamline:

- Increase of the vacuum chamber apertures



- NE8 measurements 15-23 February
- NE5 measurements 26 February – 2 March (should be repeated after installation of new instrumentation chambers)
- FRS measurements 5-12 March
- SIS18-HEST interface (TS1MU1): measurements 9-27 April
- I. Pschorn coordinates alignment efforts, additional funding for external companies is secured

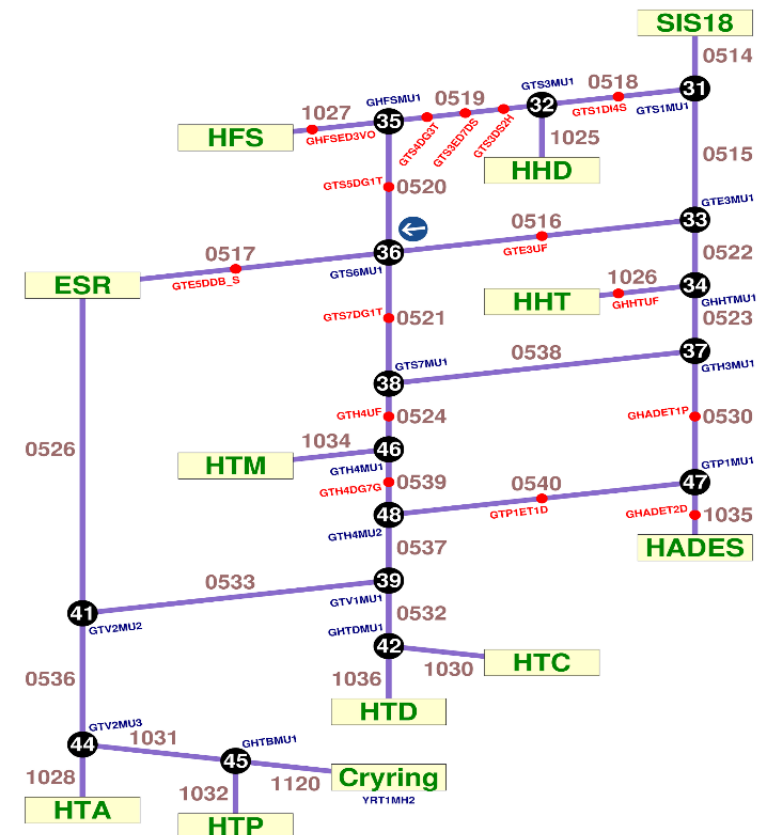
Lots of alignment requests before the beam time

Control system, LSA settings

- New control system vertical test during the last 4 Dry Runs
- Loading optics, execution of optics sequence
- Numerous BI instruments tested.
- Which LSA settings are needed?

S000	HHD/HTP	Ar, 238-U, 208-Pb	✗
S000, S477	HAD	107-Ag	✗
S000, F000, NUSTAR	HFS	208-Pb, 107-Ag	✗
E000	ESR	107-Ag, 238-U, 208-Pb	✗
S471	HTD	107-Ag	
SMAT	HTA	208-Pb, 238-U	
SBIO	HTA/HTM	12-C	
U000/S000/S444	HTC	1-p, 12-C	
NUSTAR	HFS-HTC	238-U	✗

- preliminary list of 9 optics settings for 2018
- 4 have preliminary settings already in LSA
- tools to convert MIRKO and IBHS to LSA in advanced development



These settings will be in LSA for 2018 beam time.

- These are initial settings which we will need (at least) tuning.
- In the past tuning was efficiently done using **potiboard** allowing fast adjustment of correctors or **MIRKO expert** allowing correction calculation based on model and beam measurement.
- Past experience: time needed to setup the beam line between 1 hour for simple cases to many hours (HTA).
- Potiboard is not available with new control system where numbers must be typed manually – **slower feedback – longer setting times!**
- MIRKO expert also not available.
- **Remedy? Integrate jMIRKO/jMAD into control system?**
- Nobody is working on that and it is getting late...

- Without beam:
 - Power all magnets (using sequencer)
 - Check if all BI insertable instruments move
 - Check if vacuum valves move
 - Lot of that already done with Dry Runs 1-4
 - Dry Run 5-6 aim to test all equipment
- With beam:
 - Use “pilot beam” – low intensity, fast extraction
 - Guide the beam through the beamline from screen to screen, measure position, profile and transmission through sectors of beam line

- Measure position and angle of extracted beam (pickups in GTE1DK1 and GTE2DP1)
- Measure mismatch between HEST and SIS18
- Optics measurement along the beam lines (using BPMs when possible, screens+quadrupole strength variations)
- Spill structure measurements
- Commissioning of HEST BLMs
- Testing HADES pion target optics – measurements of loss locations
- ...

- Lots of technical decision to be taken NOW depend on how HEST is going to be used in FAIR era .
- A feedback from experiments and/or discussion at PAC is needed to identify general strategy for the future.

- HEST hardware will be ready for 2018 beam time.
- Control system tested during Dry Runs.
- Schedule is quite tight for **alignment**.
- Basic LSA setup will be available for beam time.
- HEST setup times are expected to be longer than in the past – a need for online model integrated in Control System.
- Having **online model** would be a great help.
- Lots of machine studies – mainly optics measurements - to be carried out during BT2018

Acknowledgements: C. Kleffner (former MK), B. Schlei (LSA hierarchies), S. Ratschow (MIRKO optices), Grossmontage, Vacuum, Instrumentation,...