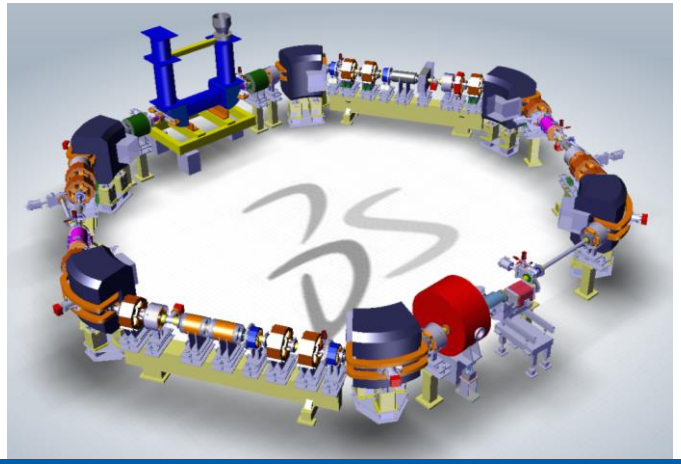
ADUC meeting, 17 Jan 2017

ELENA installation and commissioning status



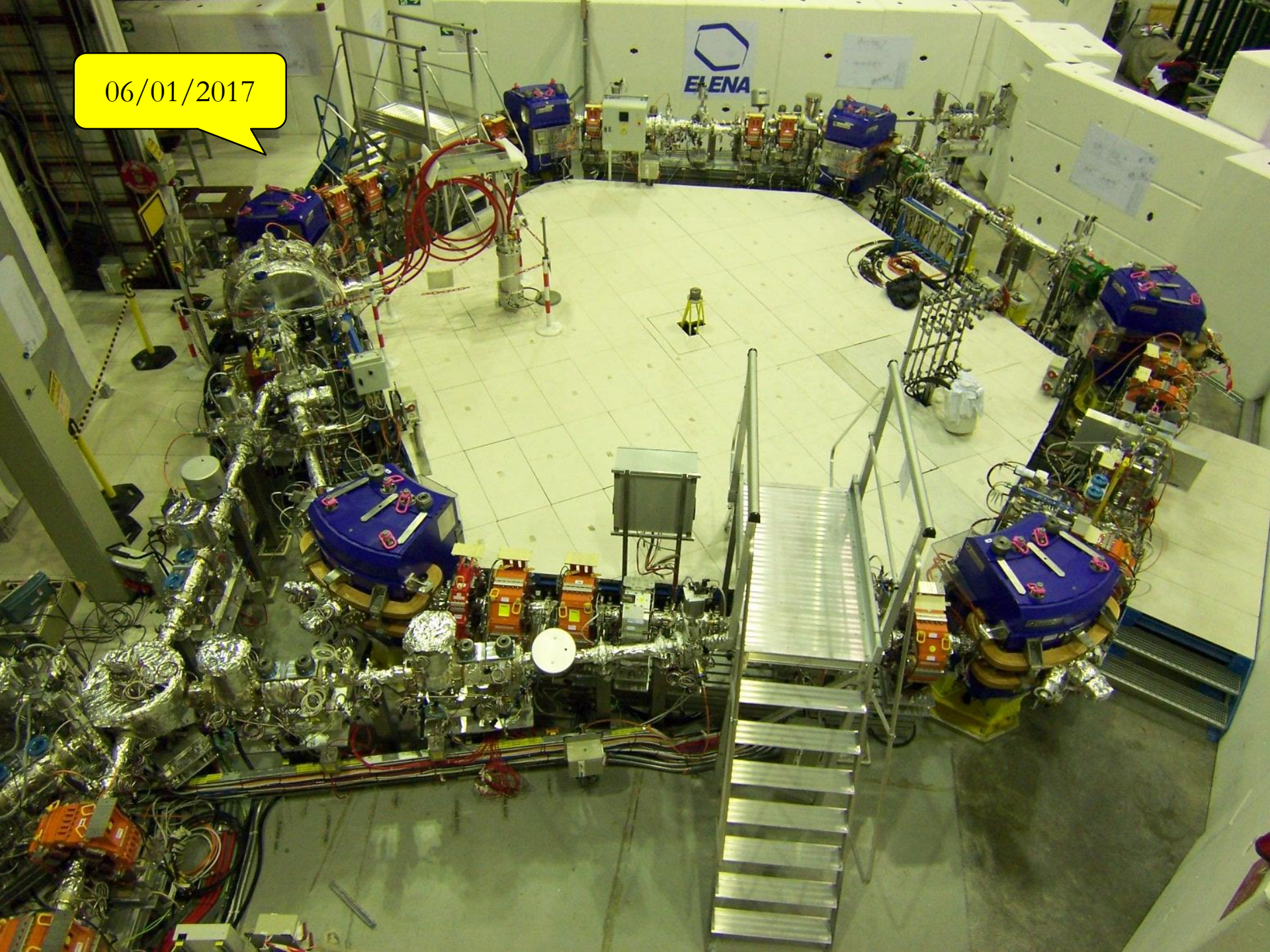
ANTIMATTER FACTORY

ELENA

Infrastructure installation

Infrastructure installation is complete:

- ✓ Racks installation complete in AD hall and power room
- ✓ Signal cables and connectors installation complete
- ✓ AC powering to racks and around ring complete
- ✓ Optical fibers installation complete
- ✓ IT connections complete
- ✓ Shielding elements installation complete
- ✓ RP equipment complete
- ✓ Access system operational
- ✓ Support and access structures installation complete
- ✓ Power converters installation complete


06/01/2017
ELENA

Machine ring elements

All machine ring elements are installed, but:

- Electron cooler: See G. Tranquille's talk for details

- Correction dipoles: 8 out of 10 installed (completion expected 25th January, alignment to follow). Can be fitted around beam pipe without perturbation

2 additional correction dipoles will come with e-cooler

Transfer lines (Phase 1):

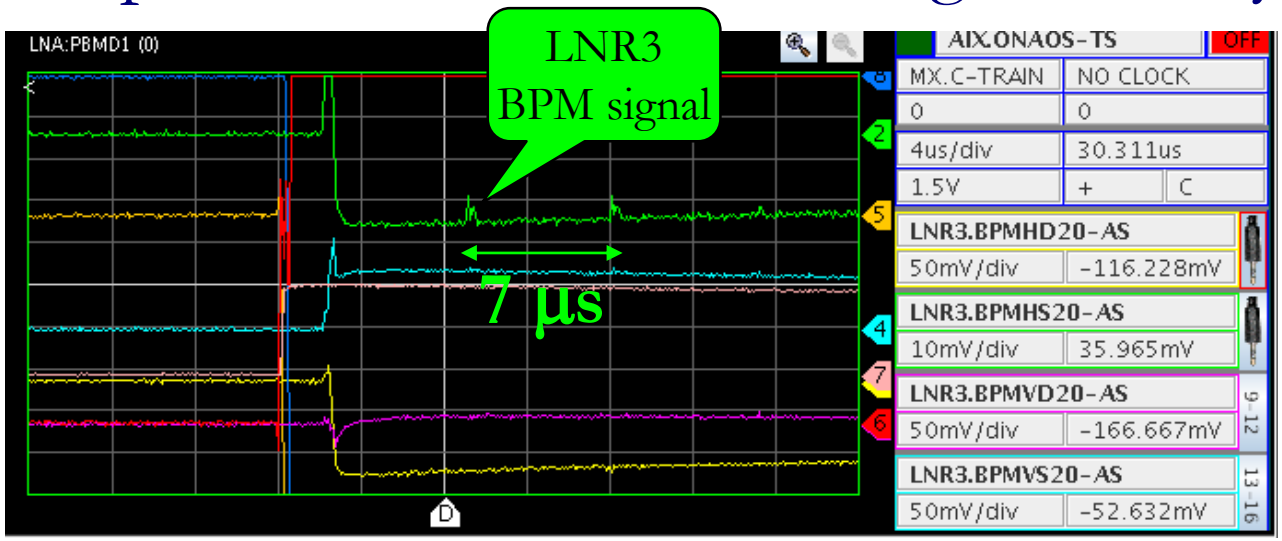
- LNS Injection line from source: complete, SEM not yet complete, only 4 channels connected
- LNI injection line from AD: complete, but 2 SEM missing (being assembled)
- LNE00 ejection line: 3 SEM +1 LPU missing (availability TBC, internal electric problem)
- LNE50 ejection line to GBAR: 2 SEM, 1 LPU missing (being repaired, availability TBC), will be replaced by beam tube if needed
- All transfer lines are leak-tight and remain to be vacuum baked-out

Main problems encountered

- Vacuum elements availability (bending magnet chambers and supports, LNS pumping chamber, ECR fast valves etc.)
- NEG coating issues (LPU, BPM, kicker)
- Injection kicker external and internal (virtual) vacuum leaks: vacuum level now nearing 6.10^{-11} mbar…
- SEM production delays, cleanliness, read-out availability
- Correction dipoles production delays (complex H/V combined design).
- Electron cooler magnetic system production and testing

ELENA Commissioning status

- First completed turn in ELENA ring on Friday 18/11

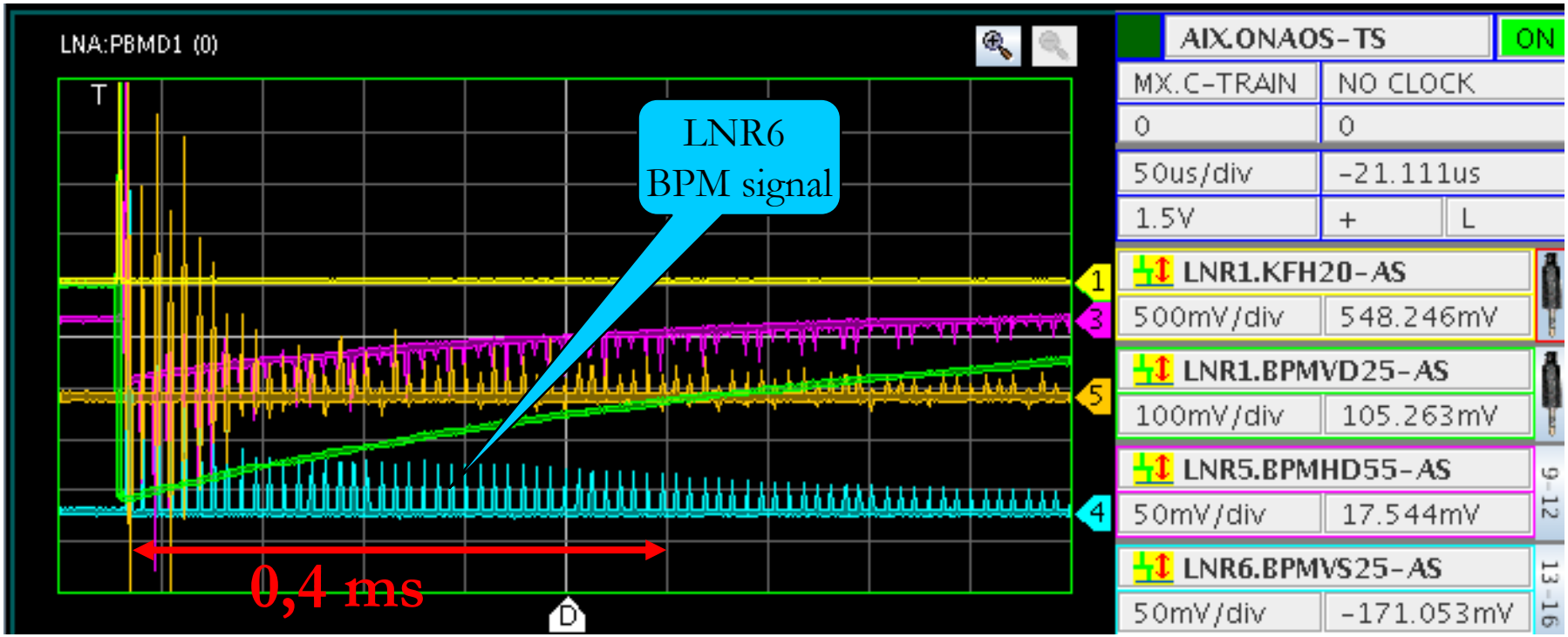


- Many systems working well from the start w. minor debugging; Source incl. controls, timing, cycle editor, BTV:s, vacuum, access system, OASIS, scraper movement, BPM:s etc….

Courtesy T. Eriksson

ELENA commissioning status

- After further tuning, beam is injected and can be observed on BPM:s for 1-2 ms on Wednesday 23/11



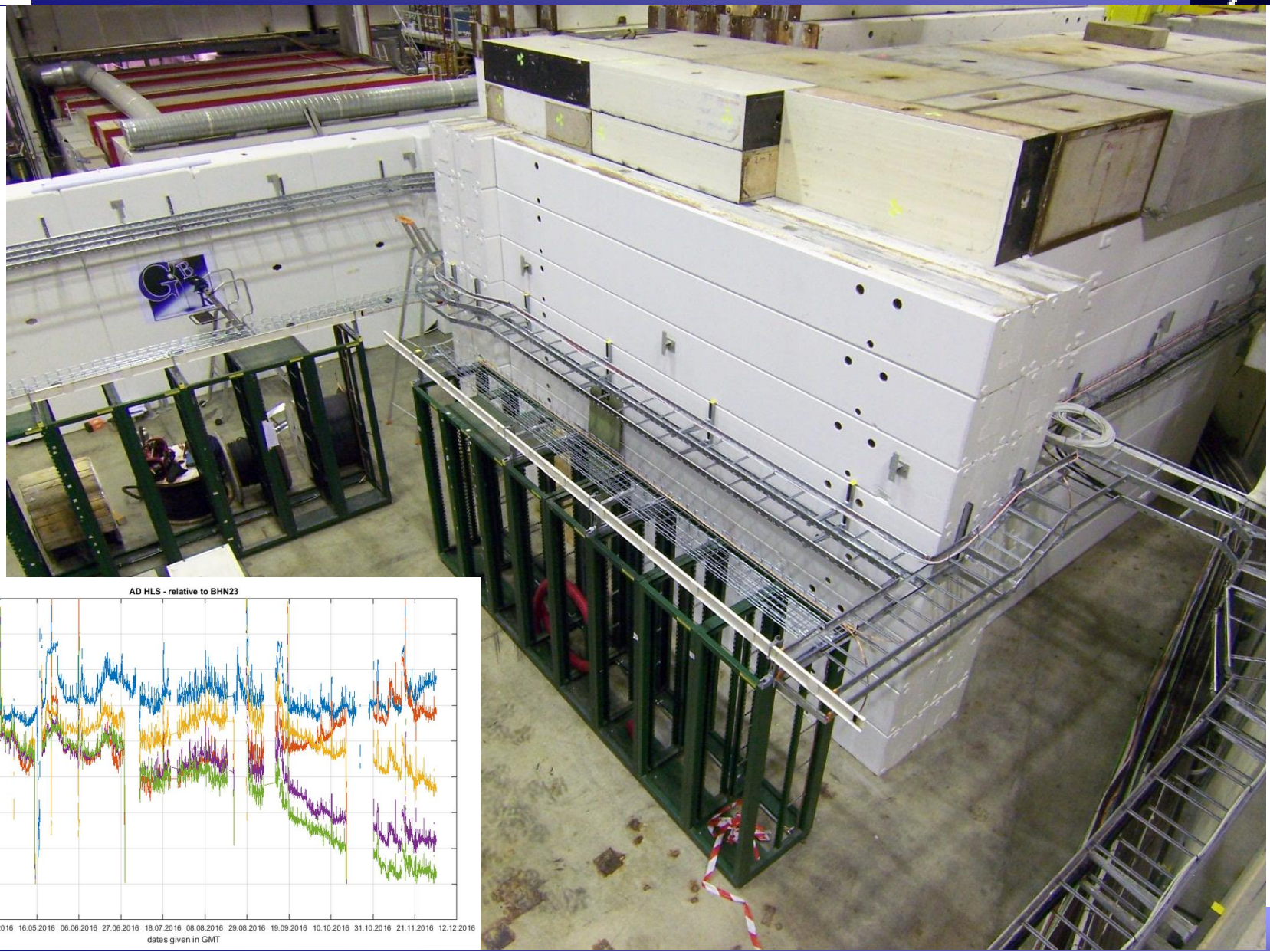
- Until ion source insulator broke on 25th Nov… No more beam till 13th Feb 2017

Courtesy T. Eriksson

GBAR experimental area

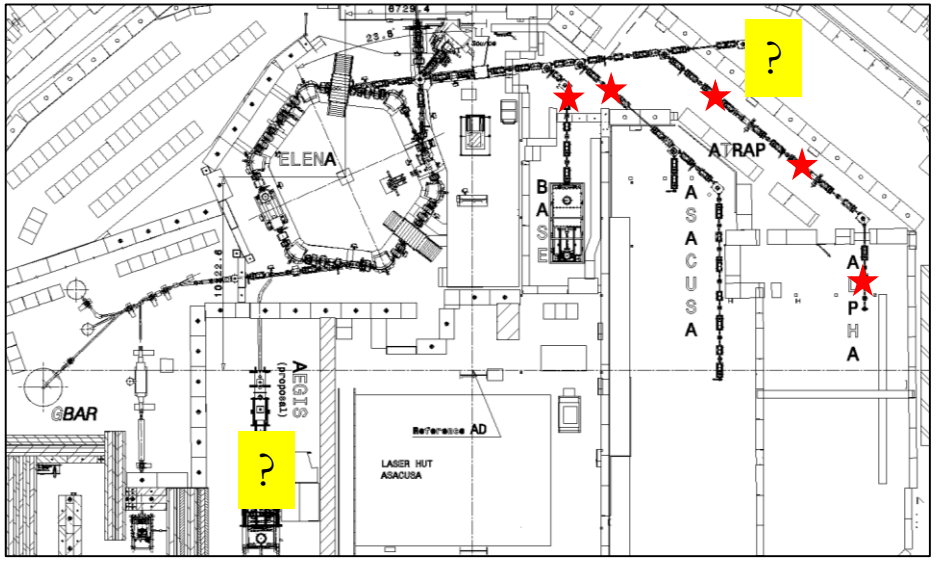
- Infrastructure installation in progress:
  - LINAC bunker installed, waiting for LINAC to close roof, Paint job will be completed then, Safety grid to be added over access point
  - Racks installed
  - Cables trays installed
  - Cabling ongoing (RP, access control, LINAC alim..)
  - Cooling water piping ongoing
  - Access control system in place
  - Shielding complete

LINAC bunker installation status

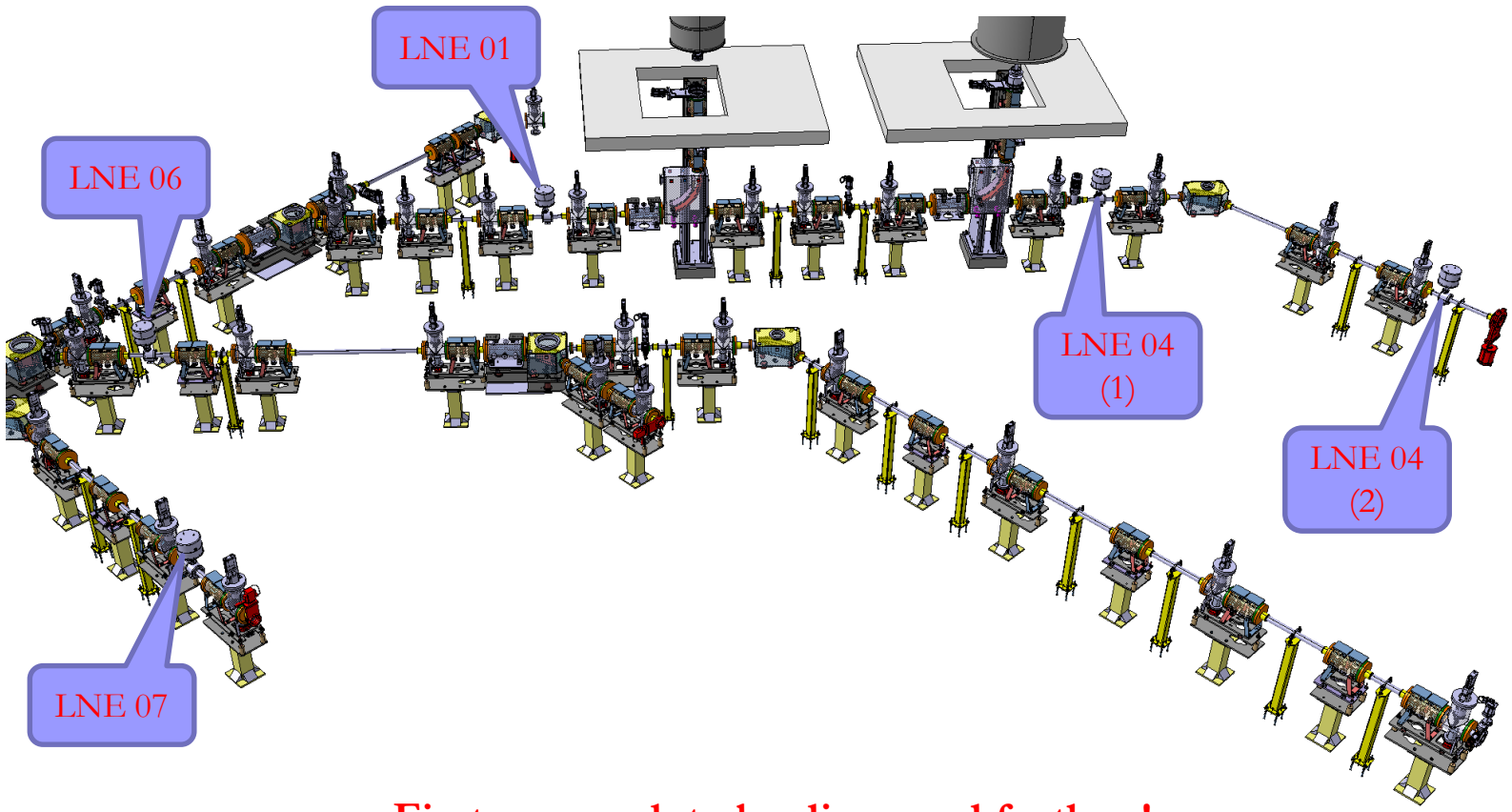


Transfer lines phase 2

- Transfer lines installation planned for LS2 (as of December 2018)
- Proposed planning entered in PLAN, waiting for confirmation from service groups
- Pending question: fast valves for experiments protection



Transfer lines fast valves



First proposal, to be discussed further !
Financing expected from concerned experiments…

Conclusions 1

- Infrastructure installation was complete, in time
- Installation of injection line inside AD shielding was performed during 2016 YETS in time
- Ion source was available in time
- Some ring elements production, vacuum system and SEM monitoring encountered issues, resulting in a 4 months delay on commissioning start
- First H- injected beam on 16th Nov, circulating beams observed on 18th Nov, max ~500 turns…
- Electron cooling process to be tested spring 2017
- Big thank you to the whole installation team !

Conclusions 2

- GBAR infrastructure progressing well, expected to be complete for LINAC delivery (30th January)
- Bunker ready to host LINAC and Klystron
- No noticeable impact on AD alignment
- ELENA Extraction line LNE expected to be ready in March 2017
- All remaining transfer lines installation planned for LS2, fast valves integration/financing to be agreed