WRAP UP OF MY WORK AT CERN

Johanna Glutting
ALIGNMENT OF NOZZLES AND SKIMMERS

- Alignment of a subassembly in lab
- Alignment of the laser to the nozzle
  - Different procedures for cylindrical nozzle and for nozzles with divergent exit
- Alignment of the nozzle and skimmer according to reference images taken of the laser
- Alignment possible for V2 and V3 design
- Alignment manual is a EDMS document: 2218683

- Gerhard, Giannis and Stefano did the alignment
• Multilayer coating by Polyteknik coating for the black insert
• Amorphous carbon coating for the copper liner
• InoxColor chromium oxide for the interaction chamber and smaller parts (optical target, screws, nuts)
SIMULATION TOOL FOR THE EFFECT OF THE GAS JET THICKNESS ON THE FLUORESCENCE IMAGE

- Tool simulates the fluorescence image
- Base is
  - Distribution of densities in the gasjet and the residual gas (image or array)
  - Distribution of the particle beams (image or array)
- This tool runs much faster under a compiled language compared to an interpreted language (C++ is faster than Octave or Python)
- The amount of imprecision by the gas jet thickness and soft edges of the jet can be evaluated
  - How good can the information obtained from a fluorescence image be
DEMONSTRATOR DESIGN – STAGE 1

- All drawings are signed
- Order of LBD is placed (?)
- Optical resolution target: waiting for feedback from manufacturer
- Valves need to be ordered soon, waiting for new quotation
DEMONSTRATOR DESIGN – STAGE 2

- 3 options for the design of the injection side – assembly sequences documented in alignment manual
- New version with “plug in” skimmer assembly – design of the bellows for volume separation still to be made
Two design proposals for the LHC version

Test stand proposal: can be rotated by 90° if needed → interaction chamber and supports are the main difference to the LHC BGC demonstrator design
TO DO LIST

Johanna Glutting
Cockcroft Experimental Setup

- Send the flat divergent nozzle
- Send the CD nozzle ???
- Do they want the shorter gas injection chambers with the fixed nozzle IP distance?
STAGE ONE OF THE BGC DEMONSTRATOR

- Pick up of the Black inserts (Emilien)
- Pick up of the RF-spring (Julien Finelle)
- Status of the Manufacture of the Interaction chamber and Supports
- Modification of the LBD
- Manufacture of the optical resolution target
BLACKENING (STAGE ONE)

- Test chamber of chromium oxide coating
  - Protection of the knife edges?
  - Send all in vacuum screws as well for coating for lower reflectivity → must be inox
  - Also send the optical target raw parts
- When the chamber is back
  - Optical measurements
  - Vacuum acceptance test with leak test
- Email takes very long at InoxColor → call them first

- Status of the chemical oxidation process proposed by Marcel Himmerlich
- Waiting for response from Polyteknik for new quotation
  - How many pieces do we want to be coated?
- Roughening for lower reflectivity and more diffuse reflection?
STAGE TWO OF THE BGC DEMONSTRATOR

- Hand over of the design to the design office
  - Decision for dump section
- Seal of the CD nozzle and test
- Design of the Bellows
  - Seal of the touching surfaces
  - Right dimensioning for needed force
    - Both with test setup
- Design of the supports for the injection side
- Does the dump eaves need a support?
GENERAL

- Status of the next CD nozzle that Ahmed promised
- Update simplified model for Joao
- Finish ECR for stage 2
- Simulations of the new design?
HEL TEST STAND

- Decision for the position of the BGC in the test stand has effect on the BGC design
  - Between the first two magnets \( \rightarrow \) less modifications and new Hel parts
  - After a vacuum valve

- What is the pressure in the current setup with the electron gun on
  - Can we make a simple measurement of the current light background?
HEL LHC

- Check if the helium tank can move → space for optics to go straight = no mirror
- How can we attach the BGC to the magnet housing
- Test setup of e.g. wood to prove that the design can be assembled