BGC Collaboration Meeting Minutes December 2020

Date: 2020-12-10 & 11 (2 half days)	***Project/Activity:*** WP13 – Beam Gas Curtain

Day 1 Attendees: A. Rossi (AS), A. Churchman (AC), A. Salehilashkajani (AS), C. Welsch (CW), C. Pasquino (CP), G. Schneider (GS), H. Zhang (HZ), H. Bhaat (HB), I. Papazoglou (IP), J. Storey (JS), M. Ady (MA), N. Kumar (NK), N.S. Chritin (NSC), N. Jens (NJ), O. Sedlacek (OS), P. Forck (PF), R. Veness (RV), R. Jones (RJ), S. Udrea (SU), S. Sadovich (SS), S. Mazzoni (SM), T. Lefevre (TL), G. Bregliozzi (GB), G. Trad (GT), B. Spear (BS), L.P. Franca (LPF).

Day 2 Attendees: A. Rossi (AS), A. Salehilashkajani (AS), C. Welsch (CW), C. Pasquino (CP), G. Schneider (GS), G. Bregliozzi (GB), H. Zhang (HZ), H. Bhaat (HB), I. Papazoglou (IP), M. Ady (MA), N. Kumar (NK), N. Jens (NJ), O. Sedlacek (OS), P. Forck (PF), R. Veness (RV), S. Mazzoni (SM), T. Lefevre (TL).

Agenda:

- For the Version 3 instrument: Give the status on the LHC tunnel installation, instrument design and procurement
- Define the Version 3 Phase 1 remaining LHC tunnel installations for 2021
- Version 3 Phase 2 manufacturing, quality control and assembly status update
- Cockcroft Institute (CI): commissioning and performance evaluation plan for Version 3 Ph. 2
- For the HEL test stand with the BGC V3 design: Define the objectives of the tests (including gases and background light from the cathodes), that can be the expected performance, define work share and planning
- For the V4 instrument with performance defined from the acceptance criteria (EDMS: 2369616): give updates on design issues including gas jet generation and vacuum constraints in the HEL context
- Summary of experimental measurements performed and results from CI since March 2020
- Fluorescence tests in LHC with distributed gas: Review results and expectations for run 3
- Discuss alternative gas jet generation
- CoVid 19 impact on BGC progress
- Review status of the collaboration, publications, manpower and budget planning
- Vacuum components (Gauges, cables, controls)

The detailed meeting timeline and presentations can be found in the Indico page:
https://indico.cern.ch/e/BGC_Collaboration_Meeting

DISCUSSION

Day 1: Thursday, 10 December 2020

1. **Rhodri Jones: Status report for HL-LHC**

- LHS3 shifted by 1 year, starting in 2025
- Updated planning and infrastructure work: Civil engineering works, SC link and MQX tests. BI BPM design.
- Explained the new HL and BI structure.

2. **Carsten Welsch: CI collaboration**

- Secured almost 1 MGBP for two gas jets (full funding, no cuts) for hardware and manpower
- Collaboration agreement: Phase 1 still being finalized, Phase 2 delayed due to covid-19
    - BGC acceptance criteria the only one that has been agreed
    - Some other sub-projects not yet in agreement
    - The delay doesn't impact the schedule or the experimental work —> mostly the administrative tasks delayed for Phase 2
    - Scheduling flexibility aiming toward the collaboration and performance of the instrument benefit
- Manpower at CI → looking for a new PhD student fulltime at CI to take over Amir when he graduates
- Highlighted:
    - Good synergies for high energy or intensities for gas jets → interest in diversifying the program with new applications
    - Measured vs. simulated gas jet profiles
    - Experimental work is ongoing, probably one of the projects still working
    - Fresnel Zone Plates studies and protypes produced, to be tested on V2 at CI
    - Most parts delivered for the v3
- 3 Journal papers in production, no conferences foreseen due to Covid
    - IPAC no publication for the posters
    - PRL on BGC with gases and LHC residual sheet
    - PRAB and NIM for gas density, geometry, v3 device
- Overall, the collaboration has expanded more than initially expected
- Strong team at Cockcroft with Carsten, Oznur (Deputy group leader), Hao, Narender, Amir, Ondrej, Luana, Bethany and a future new PhD.

3. <u>Raymond Veness: Introduction to the workshop</u>

- Presented the objectives of this Collaboration meeting and reviewed the actions least from the last collaboration meeting, to be reported during this meeting
- BGC Phase 1 is successfully installed in the LHC → gives the project a footing in the LHC to keep building the instrument
- Acceptance criteria is finalized
- Project roadmap:
    - New roadmap version with the same tasks but shifted. LS2 is extended by 1 yr. so no beam for the background program for the initial time slot → moved in 2022

- Postponed the installation of V3 gas injection from the end of 2021 to end of 2022. Secured the same time to do physics as the Run 3 is extended by 1 yr. but it gives us more time to do tests in the HEL test stand and background gas measurements in the LHC
- Need to agree if the final design (V4) needs to be delivered mid 2023 of later (might be better for both the scientific and organizational POV)

- Summary: Despite the covid there is strong progress

4. 2020 experimental results from CI

Amir Salehilashkajani: Experimental results and plan

- Demonstrated Version 2 BGC experimental setup at CI
- Pressure profile between 1st and 2nd skimmer can be measured with the movable gauge reposition
- Summarized the tested nozzle diameters (one-piece cylindric nozzle 30 µm, a 3-piece nozzle of 20 µm, 30 µm and 50 µm and a flat-divergent nozzle with an opening diameter with 60 µm) with best performing 30 µm (diameter) x 100 µm (depth)
- Phosphor screen measurements:
  - 2 measurements with focused beam and larger beam
  - Tested for different pulse width (10, 50, 100 µs) and the width increases on the screen, effects under investigation
- New 2nd skimmers with inlet pressure 5 bar Neon and Nitrogen:
  - Flat skimmers with round slit (d=2 mm) and slit opening (0.5 mm x 1.8 mm). Old skimmer d = 0.4 mm
  - presented the different pressures measured in the gas injection system volumes (compared with moveable gauge)
  - Nitrogen 2D gas density profile: Peak density at the IP increased by a factor of 2 when going from 0.4 mm to 2 mm. Neon presents higher peak than Nitrogen
  - The process of aligning these larger skimmers is more complicated and time consuming

Q&A:

RV: results for Flat vs Conical, from simulations there should be no difference and the flat should be easier to produce. AS: The size is different as the skimmer is larger (didn't test the same skimmer in flat and conical). The flat is larger, so it is not so simple to compare. MA: In simulations the peak density shouldn't have changed so these results are interesting. HZ: There might be a misalignment resulting in different measurements → need to investigate.

PF: Phosphor screen. Important to understand this as we will see this in the HEL stand. Was the phosphor properly discharged? Was this considered? Phosphor screen is grounded and how, as phosphor is an insulator. HZ: Will check, perhaps follow up also with Adriana. TL: what phosphor are you using? HZ: P43 on alumina. PF: this is unusual as it's also an insulator and would also scintillate. SU: It is 5 micron on phosphor on aluminum. So, assuming that the aluminum sheet is grounded, that grounding should be good.

TL: Why is there more noise in the right side than the left for the fluorescent measurements? AS: it is because the faraday cup is not blackened

Hao Zhang: Simulations for gas flow (gas distribution)

- Experiment vs Simulation (molecular flow simulations of single particle tracking and density calculated statistically):
    - Density and distribution present a good match
    - Nitrogen has higher velocity spread than Neon
    - 5x higher for neon
    - There is a misalignment in the measurements
    - There is a discrepancy of factor of 2 not sure why yet —> a master student is working on it
- Presented a plan to continue the simulation validation: Try multiple location simulation check, interferometry for nozzle chamber and second moveable gauge

Q&A:

RV: are you getting a 2nd movable gauge? Where are they located? HZ: Yes, perhaps ready by the end of January. Between 2nd and 3rd skimmer the new one can be after the interaction chamber. Can measure 2 locations at the same setup.

SU and PF: Nitrogen narrower than Neon on image, but not on simulation. Define a region of interest plot on the simulation results we need to understand the distribution better, maybe get a line plot

Hao Zhang: Design and procurement of V3 for the EBTS:

- Interaction Chamber was designed by CI and is functionally identical with the LHC model
    - Showed real pictures of the system components manufactured, covered the manufacturing\procurement status and the evaluation plan
- Cameras:
    - Pointed out that the imaging system needs some redesigned mechanics for motorizing the filter wheel and move it vertical and that we need to clarify the use and design of the cameras
    - We can buy a v4 system early and use it for the background gas tests
    - V2 will stay at CI, V3 for CI test and then to EBTS and LHC and V4 System
    - Will use new cathodes (see meeting 23/10/2020). But whether to use fast gating of 3ns is not decided.
    - Can be purchased for v3 LHC test in case LHC residual gas experiment require an imaging system
- Edwards primary pumps: they have no auto pressure hold —> they need an additional “electrical wall” (Valve) in this system
- Control system based on Arduino and MATLAB. Used for CI testing and EBTS → New system for LHC

Q&A

SM: Imaging system: the motorized filter wheel is needed for the LHC instrument but not sure if it is needed for the EBTS. It depends on the access in the setup

Regarding moving the whole system: Do we need a manual or remote moving the whole image system as long as the target is manual.

SU suggests adding a lens on the filter wheel to remove the motorization completely.

The filters should be motorized but we need to reconsider the whole system.

CP: Can we test interlocks before delivery to CERN? HZ: Yes. CP: How are the chambers stored now? HZ: All chambers are safely wrapped. Will produce vacuum report for chambers

5. Marton Ady: CERN simulation results comparison with CI Experiments

- Simulated a flatter top rather than a gaussian pressure distribution. Modelled for Molecular flow only (assuming after the first skimmer). Differences depending on assumptions for continuum flow. Use $\cos^n$ for the simulations
- Limits due to the conical dimensions of the first skimmer. As divergence increases, find increase in scattering
- Some scattering from the internal walls of skimmer 2 also diffuse transport. Collimated vs. peaked depends on collimation level of skimmer 1
- Comparing, gives cos 1000 or 800, so very small range!
- Previously he had assumed cos 50, so needed to re-analyse. Backgrounds pressure does not change much, still in the low 10e-9 in interaction chamber. Also, previously scaled with numbers on the IP, based on the allowable background pressure. This means that there is not a large difference on the gas jet in the end

Q&A:

HZ: Effect of thermal velocities. MA: thinks that this is marginal as thermal velocities are ~40ms-1. Hao has someone available to do this calculations, so will do it.

PF: Asymmetry vs. density increase. Can we improve? HZ: has some ideas for this and will work on it.

SU: Questions on the method for producing different gas shapes. Can we apply a scaling angle? Power law rather than scaling? MA: No, it's for historical reasons.

SU: Can we make a better way of simulating to avoid resulting in a simulation where the density does not increase even though the jet is more collimated.

6. Stefano Mazzoni: Fluorescence measurements and plan for run 3

- Presents the systems to be installed in the racks in the LHC
  - Cables for motors or low voltages signal and 12 fibres in total 6 Multi Mode 6 Single Mode
  - Procurement: most of the things are either delivered or ordered
  - Open points:

  - Do we need fast timing and how much will it cost?
  - Do we need the camera to move automatically?
  - Clarify when the optical instruments will be used and where?
- S2N for the LHC tests and estimates for the new instrument/tests
  - measurements only in low energy
  - S2N goes up sqrt(t) with the integration time
- High energy low S2N (10e-5 lower than LE for p+). Improvements
  - Increased with the better coating
  - BGC location —> not so much radiation
  - Different gas (N x 5 light yield than Neon)
- Controls for EBTS replicate LHC setup. Maybe a PC with local controls enough. Details to be developed.

Q&A

MA: Did some stray light estimation in the past see presentations: https://indico.cern.ch/event/862663/#5-synchroton-radiation-vs-illu and https://indico.cern.ch/event/813734/#4-synchrotron-radiation-simula

AR: The choice of the gas: we can go over 2 types of gas in the EBTS

HZ: Suggests having 2 different set of skimmers, 1 for EBTS and one for LHC

7. Serban Udrea: comments on camera systems etc.

- Signal intensity estimation formula —> Single photon detection capability is necessary
  - Signal density of e- and p+ is not much different even though e- produce more photons → they are spread in larger area
  - Can achieve 10e8 amplification using MCP
- Presented different camera technologies and their advantages (CCD/ICCD/EBCCD/emCCD/sCMOS)
  - We most likely need a modular design so we can remove and replace the camera part if it gets radiation damage keeping the (expensive) multiplier
  - Camera choice: Still believe that the camera choice is correct especially if we are considered for radiation damage as the other systems might have small improvements but are not worth the risk
- Simulations of expected images:
  - Ideal gas curtain — no thickness
  - N2 is not a good choice here
  - Intensity and gas thickness

- After d/σ = 4-5 we don't gain so much intensity in the signal rather smears it to the detection → lose in resolution

Q&A

RV: Camera choice? SU: still thinks that the current choice is good. EMCCD not really better. sCMOS is similar, but cheaper. Still ~10kEuros.

HZ: Have a student who can work on distortions for the HEL.

HZ: Gas jet thickness. He gives an upper limit, but can he give a lower limit? SU: There is no 'too narrow' just not enough density. Already 30% distortion at 2 sigma. Can he make a plot of distortion vs. number of sigma? GS: this means 1.5mm thickness. Can we have this for the v3 instrument on the HEL. At IP: we need to have 1.5mm width if we are not interested in small details and we could increase the signal by 2.5 compared to if we had thickness of 1σ.

8. Sergey Sadovich: HEL & HEL-TS

- HEL: Updated dimensions of the e- beam. Outer diameter 9 mm flat top 31mm injection with +- 4mm
- EBTS:
    - Duty cycle: 35-65%. At BGC: 10Kev 5A pulses, 9-31 mm. diameter There is a YAG screen on the instrument box
    - Solenoids are under production. Starting on Jan - March 2021 with an existing solenoid, gun, beam diagnostics and collector. Reconfigure the TS in March with all the Solenoids → Commissioning from June
    - 2021 schedule presented

Q&A:

AR: Size is smaller than declared last time. Still need to confirm the magnetic field in the BGC location:

- The calculations are done without the BGC
- The diameter will be in the order of 9 - 31 mm not 100% fixed yet (was 42 mm)

TL: Controls infrastructure, installed and needed? They have systems for magnets, vacuum etc., but not for the BGC. Controls infrastructure in the HEL-TS: Controls for magnets, e-gun, valves and pumps but nothing for the BGC yet. TL: Do we have remote controls? RV: not currently planned. Perhaps consider this to avoid doubling the work for the LHC.

PF: why are the BPMs so long. SS: BPMs for the HEL test will be strip line. PF: BPM - can we use this for BGC comparison? SS: it's a prototype for HEL. Can control current and shape. Will be interesting place to compare measurements.

Restrictions on Hi-Voltage training, Solenoids slight radioactive —> Dosimeter necessary. Everyone that comes to work on EBTS needs to spend some days training

Can use the test stand to cross check the measurements of the BGC and the BPM and the BGC and the YAG screen. At the location of the BGC might have some changes due to beam transfer

AR: Duty Cycle 35-64%: The beam will not be always ON in the LHC. It will be on for 16/9 circles

9. Noah Jens: Light simulations for EBTS

- Input: 1.3e13 photons/s emitted by the cathode
- Output: 1783 ph/s hitting the camera (Reflection of stainless - assumed mirror-like, so overestimate)
- Estimated power in the bandwidth of interest. +/-10%

Q&A:

IP: BGC chamber not coated with α-C for the test stand —> it would be interesting to see how much the chamber influences the result —> run the simulation one more time with SS chamber and compare the results. CP: Will be good to have the answer as it will be very expensive to improve the coatings

SM: Can we get the distribution of the 1783 photons? MA: probably more in the centre.

RV: Do you think these are many photons? SM: Per rotation (1/50 s) about 0.2 per bunch per second per cm length with 1e11 bunches so we might have quite few photons

SU: we need to consider the cathode as a Lambertian emitter (distribution) as we might miss 2-4 factor. The dark counts are a few hundred photos/sec (900), and the new Photo cathode will give better

SM: What is the wavelength? 20 nm around 500 nm

GS: Suggested these simulations in order to make some measurements in the EBTS and check them → understand what to expect at the HEL as well

10. Raymond Veness: EBTS plan

- Only opportunity to test our system with high energy e- beam (from 0.7 mA to CI to 5 A at EBTS) and magnets. And validate the whole instrument at CERN before installation in the LHC → we need to take advantage of it as much as we can
    - Demonstrate the safe (to machine) operation of the vacuum control system and interlocks → VSC 'buy-in' is essential
    - Learn how to operate this instrument at CERN and how to acquire data → Teamwork (plus documentation) from CERN (BGC+HEL+VSC), CI, and GSI are key here
- Gas choice: we still don't have decided 100% for Neon or N2 → use the TS to test them both as they both have advantages
- Preliminary list of tests together with required time and list of skills necessary for completion
- Project management aspects for the BGC in the EBTS → Necessary to have dedicated project manager and team to control the schedule/processes as there is a lot of work and planning
- One or more persons must be available for the operation of the BGC on the HEL. Persons from CI, CERN and GSI should be active on this job. To be detailed in the coming up regular collaboration meetings.

Day 2: Friday, 11 December 2020

11. Ioannis Papazoglou: Version 3 updates

- Presented the terminology and versions. Coatings
- Vantablack has wide band low reflectivity
- Changes to Ph2. optical alignment system
- Working with VSC on valve controls

Q&A

RV: - spectra of Vantablack? CP: not too bad for unbaked. Very sensitive to handling. Cheaper than other coatings.

CP: Bellows and viewport producer. Skodok for bellows. Torr scientific for the viewport.

HZ: Estimate of delivery times for components.

12. Marton Ady: Vacuum considerations

(Talk was combined with the control systems one.)

- Need to decide who is responsible for the gas injection line pumping and controls
- Some non-standard components but not preferable. Space constraints for primaries
- Need hands-on access for testing of controls. Time is 3 months for standard, but much longer if custom
    - Complex controls with processes require extra programming.

Q&A

HZ: Discussion on dry pump design. CP: have to be careful with Teflon seals on some models.

Vacuum group would like to be present and participate in tests on HEL test stand

13. Marton Ady: Version 4 vacuum estimation

- Walks-through the logic for the geometry of the v4 system and Shows model that comes from this:
    - smaller system —> open up the skimmers
    - target 40 mm jet
    - nozzle → skimmer 3: 40-4-33-73 mm
    - Sticking factor of 20% pumped into the LHC.
    - Large impact of 'skimmer 4' on the pressure in the interaction (1/2 order of magnitude). This corresponds to 4x10e-7 mbar.l/s load on the LHC in this model. To be improved.
- we are not too far from a working instrument, but we are not there yet

Q&A

Ratio of curtain pressure/background similar to what we have today

We can try a long skimmer 3

RV: Gas load in the LHC: Is there a target figure?

HEL pumping: ion pumps, NEG surface, for neon that is not pumped by Neg will end up in the cold mass

AR: we should try and have a measurement of the background gas and the e- beam but 1e-9 shouldn't be a problem —> RV: this we could test it in the HEL test stand

GS: Ratio of jet density to background. MA: - needs to check. Yes, factor of ~100. This is good. Only leaves the LHC background as an issue.

AR: making a flat-top profile? Depends on the level of collimation of the gas jet. Hao- this is being worked-on for the design.

RV: acceptable gas load? Adriana says 10-9 is OK for the HEL. Marton: depends on gas species and pumping.

AR: we could imagine testing the v4 on the EBTS as it should be still in-place. [action - discuss possible commissioning tests with v4 at CERN]

Hao comments that pressure is always in the 10e-9 range for the tests at CI

14. Ioannis Papazoglou: Version 4 design process

- Integration locations
- Fitting into a very confined space -various options shown with constraints. TPM limit of ~5mT. May need shielding
- Coordination of this design needed. Bi-weekly meetings, mainly identifying problems. Perhaps a mock-up needed to look at assembly. [action - get a team for this with ML technician].
- Looks like v3 dump works
- The magnetic field will create issues with the TMPs placement and operation → Will need shielding → Waiting for the final studies from HEL side

Q&A

RV: TMPs in magnetic field. This is a fundamental issue that we need to look-at urgently. AR: some simulations, but significant differences between codes. Will come back ASAP.

RV: Maybe we need to get some tests with a NEG cartridge, GB: VSC have 400 l/s pump that they can lend us for testing. Also, GB comments that it will be very difficult to maintain in the space available.

TL: Also thinks that a physical model is important.

15. Gerhard Schneider: Version 4 schedule

- Presented the contract and the timeline with the deliverables

Q&A

PF: The image intensifier is also sensitive in the magnetic field so if we do the magnetic calculations, we need to also check the position of the camera.

SU: The region between the 2 solenoids is 1 or 2 Tesla? And the camera is designed to be far away to avoid this.

RV: Do we have values on the maximum allowed magnetic field? → We don't have value on that. Can be solved, to some extent, by increasing the voltage on the photo multiplier but we might risk damaging it

We need more information of the magnetic field values:

- Magnetic field mapping from HEL
- Maybe measurements in the EBTS

16. Narender Kumar: Further applications

- Showed fernel lances with focus diameter of 1µm
- Generation of quantum gas jet is feasible and demonstrated
- Use quantum gas jet as wire scanner is investigated
- Add a FZP in the location of the 3rd skimmer and move it with a xyz moveable plane from their UHV design collaboration
    - No need to move the whole system to move the jet. Moving only the FZL (and not the whole injection system) is enough → only one manipulator is enough

Q&A

IP: Why do you use a 3DoF manipulator? need 1 for scanning and 1 for tuning with the focal length of the gas jet

TL: How can you measure so small jet size? Now you are measuring mm jet sizes, how can you scale to so small? Need of new diagnostics

Maybe we can use similar diagnostics to our kind of gas jets. Now we are using a moveable gauge that is enough to measure the shape of the BGC gas

RV: The density after the Fernel Lens is always lower than before the lens? It can be higher in the centre …?

TL: the overall quantity is lower the orientation of the wholes make the particles focus somewhere that's why it is a lens. You have less particles but a better-defined shape

CW: Transmission through the lens: 15% (1/8) but the focusing area is smaller so you have a higher net effect

Academically it is very interesting but in terms of application it is still far.

- Medical applications (medical accelerators) → Use gas jet similar to the BGC to image beam for medical accelerators

17. Raymond Veness: Wrap-up and actions

- SU: only 10% or the photons reach the camera are counted less than the dark counts (180 vs 500)
- GS: we can benchmark the light simulations in the EBTS
- V4 integration far from trivial, we need to work on it next year, also taking into account the NEG vs turbo pumps

- SM: For the cameras: We need to plan for the interfaces if we use the same for EBTS and LHC —> We need to clarify how many/what/where and when camera systems we will use
- Mockup for V4 —> we can get the assistance of a technician
- Make a list of components that still need to be sent in CI

ACTIONS LIST

General planning of the BGC timeline		
Discuss delaying the deliverables from Cockcroft Institute and what this implies in terms of resources / timeline / contracts	RV	
Make a schedule for the milestones for design / procurement / assembly / testing / delivery of the V3	HZ	
Decide on gases (Neo/Nitrogen)	RV / GS	
Assign a project manager for BGC EBTS setup and operation	RV	
Decide who is responsible for the injection line pumping	GC / CP	
Define the dates for final instrument deliverables	RV	
Optical instruments - how many and where?	RV / SM / HZ	
Discuss the option of commissioning V4 on EBTS	AR / RV	
Testing		
Investigate if there is a misalignment in the nozzle/skimmer assembly at CI setup	HZ	
Get understanding about the phosphor screen and what to expect in EBTS → follow up with AR	HZ	
Secure further Vantablack samples and procedures for full acceptance	IP	
Grounding of the phosphor screen and how to make this work in the EBTS	HZ / AS	
Investigate the feasibility of slit skimmer for v4 (production/alignment)	HZ	
Mechanical mock-up of V4	GS / IP	
Make tests at CI with a NEG cartridge	RV / HZ / CP	
Manufacturing and procurement		
Produce reports for testing the produced parts at CI	HZ	
Send to HZ a list of all the left-over components and expected delivery dates	IP	
Design, calculations and studies		
Gas flow simulations vs. measurements: Check the different results between gases. Make a line plot of the 2D profiles. Define a region of interest plot on the simulation results to better understand the distribution (maybe a line plot)	HZ	
Decide if we need to motorize the camera system	SM	

Asymmetry vs density increase for the simulations and testing comparison with MA's work	HZ	
Decide if we need fast timing for the fluorescence measurements system for run 3	SM	
Clarify which optical system will be used and where	SM	
Decide the camera controls (system/hardware) for the EBTS	SM	
Verify the optimum thickness of the gas jet (1.5 mm)	GS / HZ / MA / SU	
Run the light simulation without blackened chamber	MA / NJ	
Improvements for the HEL light	MA / NJ	
Compile a list of points for the vacuum system of V3 (LHC) and start addressing them	CP	
Communicate for future simulations with a student at CI	MA / HZ	
Add the different location of the instrument to the SR background calculation	SM / MA	
Simulations: Check the difference between gases. Also make a line plot to see the distributions	HZ	
Plot the thickness vs. distortion for the gas jet	SU	
Check the stray field in the HEL inter-magnet gap	GS / AR	

Documents: *All the presentations can be found in the meeting's Indico page :*
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Distribution List: Standing members of the meeting and participants