Agenda for the BGC collaboration meeting Online

(https://indico.cern.ch/event/974686/)

10th (Afternoon: 13:30 – 17:30) and 11th (Morning: 9:00 – 12:30) December 2020

The aims of the meeting are to:

- 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)

Agenda

1. **Welcome to the review (40min) [13:30 – 14:10]**

    a. Welcome to CERN (Rhodri/Thibaut; 10min)
        i. HL-LHC status
        ii. CERN Structural change overview
    b. Cockcroft collaboration (Carsten; 15 min)
        i. Status of the collaboration
        ii. Recruitment situation and plans, financial situation, main milestones
        iii. Foreseen publications for 2021
    c. Review of actions from last meeting and objectives of the workshop (Ray; 15min)
        i. Review actions from March online meeting
        ii. Milestones for the project at CERN
        iii. Summary of future goals for the collaboration

2. **Block 1: Summary of know-how gained at Cockcroft, GSI and with 2020 experimental program, and V3 commissioning (1h45) [14:10 – 16:00]**

    a. 2020 Experimental results from Cockcroft (Hao, Amir, Narender 30min + 10min)
        i. Measurements performed in 2020 and program for 2021 on V2
            1. Nozzle design
            2. Alternative skimmer diameters and shape

3. Gas distribution simulations
4. Phosphor screen measurements

ii. Design and procurement of BGC V3 parts by Cockcroft Institute (Hao)
1. Design
2. Procurement
3. Manufacturing
4. Controls system design
5. Assembly/testing

iii. Commissioning plan for V3 at CI (Hao)
1. Performance evaluation of V3 instrument (Where, who, how)
2. Gas density in the IP
3. Plan for testing Neon and Nitrogen (and Ar?)

Coffee Break - 25 mins

b. LHC fluorescence measurements and Run 3 tests (Stefano 20min + 5min)
i. Present and 2021 activities
ii. Status of LHC setup
iii. Foreseen tests in HEL

c. Developments from GSI (Peter 15min + 5)
i. Camera choice
ii. Distortions related both to the presence of magnetic and electric fields and on properties of the gas jet curtain

3. Block 2: BGC on the HEL Test stand (1h 10 min) [16:00 – 17:15]

a. HEL test stand and Hollow e-lens update (Adriana/Sergey, 20min + 10)
i. Design and schedule for the HEL test stand (abstract)
ii. Update on HEL and electron beam diameter
iii. Update on e-lens parameters and interface
iv. HEL test stand parameters
v. Expected background light with foreseen blackening and light reducing orifices
vi. BGC design in HEL test stand
vii. BGC V3 operation: Foreseen time window, infrastructure space for racks and controls, pumps, power

b. Light estimation at the camera from cathode (Noah, 10min + 5)
i. Simulation results from lights reaching the camera from the e-gun on the HEL test stand and on the HEL

c. Test plan for BGC in HEL test stand including timeline (Ray, 15min + 10)
i. Planning
ii. Manpower
iii. Resources (Equipment, procedures etc.)

17:30 (Total time = 4h) – End of the day 1

9:00 – Start of Day 2

4. **Block 3: BGC demonstrator (V3) updates and Final instrument (V4) (2h05)**

    a. LS2 BGC Installation & Integration (Phase 1 and 2) (Giannis, 20min + 5)
        i. Installation design and status
        ii. ECR Progress
        iii. Phase 2 design and status
        iv. Nozzles design and manufacturing
    b. Vacuum considerations Version 3 (Chiara, 10min + 5)
        i. Pumping options for new mechanical design.
        ii. Vacuum pumps and gauges. Requirements, proposals, control system, cabling, responsibility / cost
        iii. Move of BGI system and connection of valves gas lines
        iv. Tests to be performed to validate gasses for LHC use (Ne, Ar, N)
    c. BGC V3 Vacuum controls system (Gregory/Chiara, 10min + 5)
        i. Requirements
        ii. Schedule
    d. Vacuum performance and limitations of V4 (M. Ady, 20 min + 5)
        i. Estimation of gas density for V4
        ii. Background pressure performance linked to the design decisions and limitations
    e. HEL BGC design and integrations (Giannis/Gerhard, 10min + 5)
        i. Design space and constraints
        ii. Design decisions
        iii. Performance impact
    f. BGC Milestones for Version 4 (Gerhard, 15min + 5)
        i. Report from new collaboration contract including timeline

Coffee break (20 min)

5. **Block 4: Gas Jet creations and applications (0h25)**
    a. Atomic seeve plates, Fernel lenses (Narender, 10min + 5)
    b. Medical applications (Narender, 10 min)
6. **Block 5: Project Status and Wrap-up (0h 45)**
    a. Discussion Wrap-up (Ray 0h 45)
        i. Identify show-stoppers
        ii. Agree priorities
        iii. Review summary

12:30 (Total time = 3.5h) End of the day 2

Total time ~7.5h