

DSG-RICH R&D Meeting

Date: October 8, 2021

Time: 9:30 AM – 12:00 PM

Attendees: Fatiha Benmokhta, Marco Contalbrigo, Valery Kubarovsky, Tyler Lemon, Marco Mirazita, Connor Pecar, Patrizia Rossi, Simone Vallarino, and Anselm Vossen

1. Discussed RICH-1 interlock trip on low air pressure

1. On Wednesday, October 6, 2021 at ~8:00PM, RICH-1's hardware interlocks turned off detector high voltage and low voltage due to a low air pressure interlock
 - Low air pressure interlock set to 50 psi
2. It appears that the new air-cooling compressor stopped working
 - Bob Miller will investigate during next scheduled controlled access period to Hall B (most likely Tuesday, October 12, 2021).
 - If needed, system will be switched to use old compressor
3. RICH-1 was and is not being used for physics data in HPS, it was turned on for RICH calibration runs and testing to get ready for Run Group M.

2. Reviewed a breakdown of RICH-2 tasks

1. Tasks split into hardware and software
2. Hardware categories:
 - Tests of components
 - Assembly in cleanroom
 - Installation in Hall B
 - Commissioning
3. Software categories
 - DAQ
 - Calibration
 - Reconstruction
 - Simulations
 - Monitoring and slow controls
4. Goal dates:
 - Mid-April 2022: RICH-2 assembled in tested in cleanroom
 - May 2022: RICH-2 installed in Hall B and ready for operation

3. Patch panel for RICH-2

1. RICH-1 patch panels were made by Argonne, but it is uncertain whether they will be contributing to RICH-2
2. Marco Mirazita will send Tyler Lemon drawing of RICH-1 patch panels so feedthroughs for the hardware interlock system's electronic panel sensors can be added for RICH-2

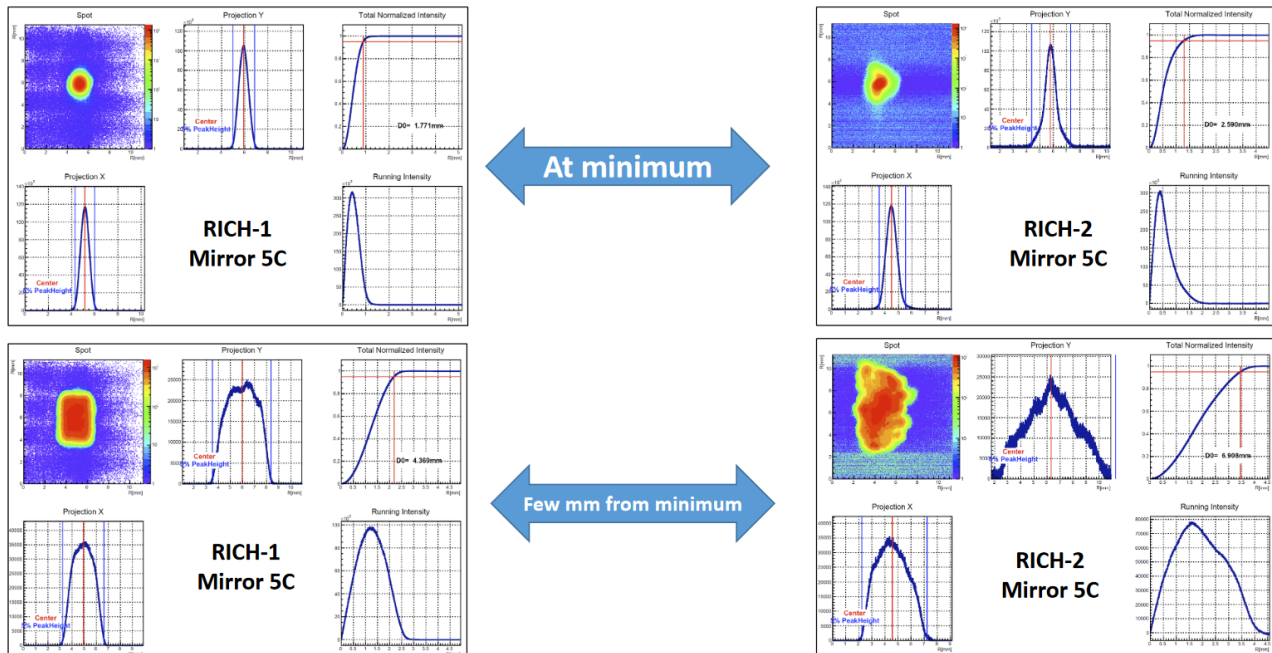
4. Cleanroom preparations

1. Floor repairs scheduled for November 1 – November 12, 2021
2. RICH assembly structure that is bolted to floor will remain in place
3. Aerogel dry cabinet will be moved into DSG small cleanroom during repairs
 - Cabinet is on wheels and can be easily moved
4. Tyler Lemon provided general overview on how floor will be repaired
 - Floor will be repaired in two sections

- All other items will be shifted to one side of room (“side A”), clearing a portion of the room (“side B”) for repairs
- After “side B” repair is complete, items in room will be moved onto “side B”, allowing floor on “side A” to be repaired.
- After all repairs are complete, the entire room will be cleaned to return it to cleanroom standard.

5. Spherical mirrors 5 and 5C’s d0 measurement and path forward

1. In comparison to mirrors for RICH-1, the two RICH-2 mirrors are not as good in terms of d0 measurement
 - D0 result is ~2.5 mm for RICH-2 where for RICH-1, it was < 2 mm
 - Image of reflected light at mirrors’ radius of curvature is not a well-defined circle
 - Image of reflected light a few millimeters away from mirrors’ radius of curvature is not in the general shape of the mirror



Marco Mirazita’s slide comparing results from RICH-1 to RICH-2 for mirror 5C.

2. Discussed path forward to rule out issues in test station as reason measurement for RICH-2 are not consistent with RICH-1.
 - Ensure CCD and mirror stands are properly aligned
 - Done October 8, 2021
 - Ensure background measured by CCD does not change over time, indicating a possible issue with CCD.
 - Take background image before and after d0 measurement
 - Verify that fiber used to direct light source is clean by polishing fiber
 - Not uniform source light could be causing non-uniform image
 - Increase intensity of light source by adjusting its trim potentiometer
 - Investigate different light source to use for tests.