

RHICf-II Research Plan

RHICf/RHICf-II Collaboration Meeting

January 27, 2022

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STAR Spin/Cold-QCD PWG meeting

- The major issues were the performance of the ZDC and the lack of peoplepower.
- ZDC performance issue
 - for luminosity measurement and local polarimeter
 - We'll summarize radial/vertical polarization, RHICf-II period, trigger rate, ZDC issues, and solutions in a table.
- Peoplepower issue
 - BNL's peoplepower is needed for installation and safety.
 - Hardware design and fabrication will be provided by RHICf-II.
 - We will develop collaborators(including technicians) in the US, too.

STAR Spin/Cold-QCD PWG meeting

- Other issues
 - For the installation of the detector, we will further evaluate the available space and the amount of work and peoplepower required.
 - We'll understand the issue of 9 o'clock blue-beam Snake failure.
 - We'll have no Roman Pot in 2024 at STAR.
 - The timeline for the construction of the RHICf-II calorimeter is shown.
 - We'll perform background simulation (reconstruction, resolution) of $\Lambda \rightarrow \text{neutron} + 2\gamma$ decay.

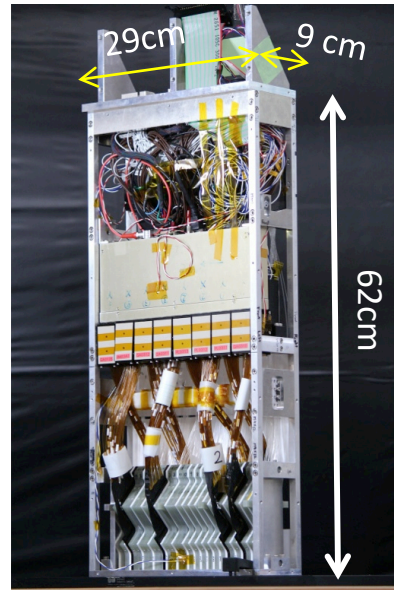
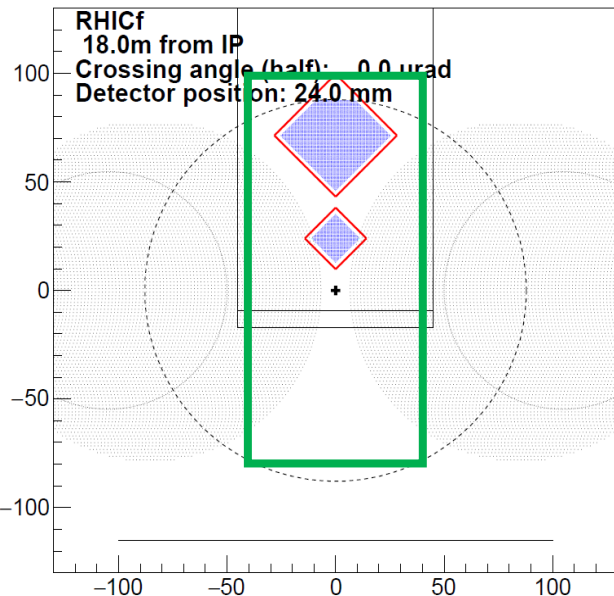
FoCal-E development

- FoCal-E prototype for test beam in 2022
 - Pad detector
 - Pixel detector
 - Trigger
 - DAQ
- Test or commissioning at RHIC in 2023
 - Configuration
 - Radiation length ~ 40
 - Trigger
 - Rare trigger for asymmetry measurement
 - K0S, Lambda, high- p_T (high- x_F)
 - Shower trigger for cross section measurement
 - DAQ
 - Standalone ALICE DAQ
 - Event correspondence with STAR DAQ

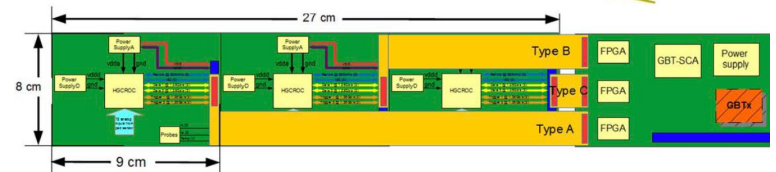
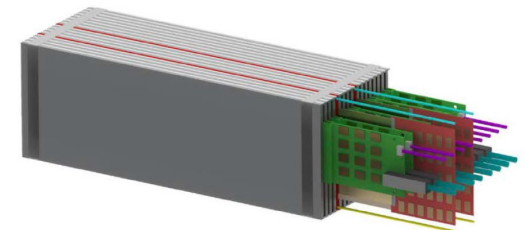
Test at STAR in 2023

- The size of the main unit is 8cm x 18cm. The enclosure, including peripherals, will be designed to fit in front of the ZDC, between the beam pipes.
 - Old (RHICf): 2cm x 2cm + 4cm x 4cm
 - New (RHICf-II): 8cm x 18cm

RHICf module

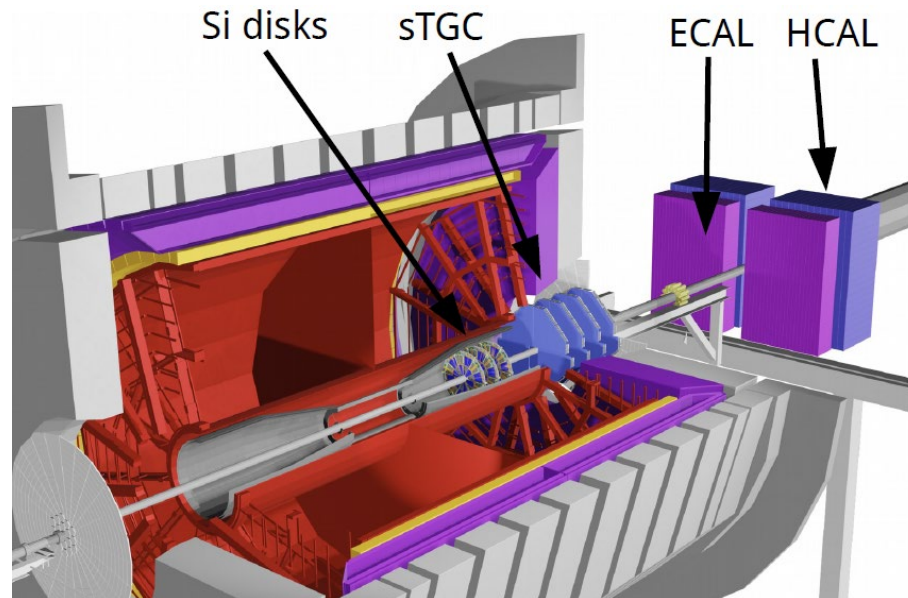


FoCal-E: 3 module design (8cm x 27cm)
(RHICf-II: 2 modules 8cm x 18cm)



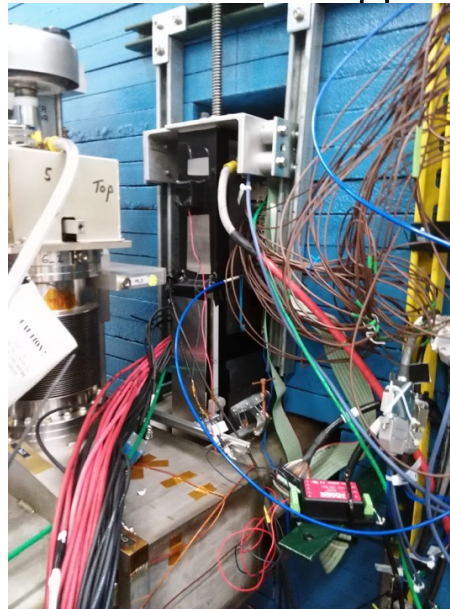
Test at STAR in 2023

- We would like to place the detector somewhere in the STAR-IR in 2023 for commissioning, and confirm the coincidence with the STAR detector.
- Can we place it between the left and right FCSs on the west side, or somewhere on the east side, preferably near the beam pipe?
- If there are any effects, we will move it to an unaffected area.



Test at STAR in 2023

- The manipulator will be manufactured in Japan that will allow us to move it upward remotely, for instance, in front of ZDC in 2024.
 - Careful manipulator design will be necessary for available space.
 - We will need cable rearrangement from 2023 to 2024.



Cooperation or collaboration

- RHICf-II collaboration
 - RIKEN, ICRR Univ. of Tokyo, JAEA, Nagoya Univ., Shibaura Inst. Tech., Tsukuba Univ.
 - Korea Univ.
 - INFN Catania, Florence
- New collaborators
 - Sejong Univ.
 - Univ. of Kansas
- Possible collaborators from EIC-Japan
- FoCal collaboration