

eRHIC IR Design Meeting

Draft Minutes for Friday, December 20, 2019

Agenda

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1 Status on geometry setup and simulations—A. Kiselev

A. Kiselev is currently away. Will revisit upon his return.

2 Area System Concept Specification—H. Witte

Title: “BNL EIC IR: Area System Concept Specification”

File: [2019-12-20-Concept-IR-HadronElectronAngles.pdf](#)

1. We need a repository for IR design files so they are all in one place.
2. Document considerations motivating changes.
3. Document design assumptions.

3 10 GeV SynRad simulations—C. Hetzel

Title: “IR meeting - Vacuum 12-20-19”

File: [IR meeting - Vacuum 12-20-19.pdf](#)

1. Needs more info on 10 GeV lattice to simulate.
2. Have implemented design with scalloping on beam pipe interior outside of detector region.
 - (a) Reduces scattering if it goes all the way to (but not entering) the detector, but at the cost of a significant increase in impedance. Needs further analysis/refinement.

3. Getting statistics at 10s would take too long to run. Reran simulations with scaled up beam size to get data on that region.
4. H. Witte: Dog leg dipoles are 40 mT in latest lattice. If that is correct, it may eliminate the need for scalloping.

4 Lumi monitor exit window—J. Adam

Title: “Luminosity monitor for the EIC update on photon exit window”

File: [JA-Lumi_20191220.pdf](#)

1. “The angle was 34.5 mrad according to the IR drawing, giving 30 times bigger effective length to the photons and a large spread of conversion points ~ 2 meters along z ” [slide 2].
2. Perpendicular exit window receives unacceptable SR power (“100 W mm⁻¹, any metal would melt”) [slide 2].
3. Tilted 1 mm, 100 mrad exit window has results comparable to flat 1 cm exit window [slide 5].
4. Need to implement beam pipe curvature in simulations [slide 7].
5. M. Sullivan: What is exit window made of?
 - (a) Window is made of aluminum in current simulations.
 - (b) M. Sullivan: Window will need water cooling then, should add it to simulations.
6. M. Sullivan: 2 cm radius at normal incidence receives 18 kW from synchrotron radiation.
 - (a) Note: The current exit window design has a radius of 5 cm. Power incident on detector is not uniform and so the power incident on an 5 cm radius window cannot be determined by simply scaling the number for 2 cm.

5 All other business

6 **Next Meeting:** Friday, January 10, 2020 from 2:30 to “3:30” p.m.

6.1 *Draft Agenda*

1. Update on SynRad simulations—C. Hetzel
2. Update on directory structure—E. Aschenauer and H. Witte
3. All other business
4. Next meeting: Friday, January 17, 2020 from 2:30 to “3:30” p.m.
 - (a) Draft Agenda