EIC IR Design Meeting

Draft Minutes for Friday, April 10, 2020

Agenda

1 Deuteron tracking—A. Jentsch

Title: "Far-Forward Detection of Nuclear Breakup Events in e+D Collisions"
File: IR_Meeting_deuteron_breakup_Alex_Jentsch_4_10_2020.pdf

1. Overall, the acceptance of e+D breakup protons and neutrons with this lattice, with the high energy configuration, yields good access to the required physics.
2. The physics groups interested in these events have seen the full reconstruction of kinematic variables as well (in the backup).
3. The majority of the proton losses are in Q1bpf.
4. Lower energy configuration still needs to be studied (next on the docket).

2 DVCS—A. Jentsch

Title: "Study of Phi Distribution in DVCS"
File: DVCS_acceptance_distributions_study_4_10_2020.pdf

3 Adding Q0eF inside detector—R. Palmer

Title: "2004-close-v5.pdf"
File: 2004-close-v5.pdf

1. Summary of Chromaticities
   (a) Gain much greater for close in Rear Q1 (28 % vs. 11 %)
   (b) Sextupole on protons from Q1eR canceled by Q1eF (for a)

2. Summary ≈ Magnet Dimensions (tapered)
   (a) The rear Q1eR looks very hard (3 cm thick for pole tip 1 T)
   (b) But this is the most useful
      i. Chromaticity gain 10 units (vs. 3.7)
      ii. B2eR can be brought in (not done yet)
   (c) Making Q1eR span e and p does not help much
      i. because aperture grows
      ii. loses proton sextupole cancellation
      iii. but bend from offset quad is in the right direction
   (d) Note no e quad in B0pF. Does this kill new design?
3. Would like to do reoptimization of forward side with magnet in detector for the purposes of reducing synchrotron radiation.
4. H. Witte: What if you didn't cancel the quad field you "got for free."

4 Bmad layout—J.S. Berg

1. H. Witte: J.S. Berg is going over H. Witte's Bmad lattice and cleaning it up. So far everything has be consistent with R. Palmer's results.

5 All other business

1. E.C. Aschenauer: How do we go about fixing the asymmetric acceptance? What are consequences for luminosity of reducing discrepancy between x and y divergence? [See section 6, item 1.]
   (a) E.C. Aschenauer: It would also be helpful if we can fix the asymmetry issue with proton acceptance [section 1].
   (b) E.C. Aschenauer: "Luminosity without acceptance is not helpful."

6 Draft agenda for Friday, April 10, 2020 from 2:30 to 3:30 p.m.

1. Consequences on luminosity of reducing the discrepancy between x and y divergence—V. Ptitsyn
2. All other business