EIC IR Design Meeting

Draft Minutes for Friday, April 17, 2020

Agenda

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

Title: "Luminosity vs proton divergencies"
File: `lumi_vs_divergence_VP.pdf`

1. Inverse proportionality in luminosity vs. divergence plot [slide 4] is due to the dependence of luminosity on other beam parameters.
2. E.C. Aschenauer: For certain physics scenarios we need acceptance rather than luminosity. Currently, we do not have sufficient acceptance in y to do asymmetry measurements with respect to φ.
3. C. Montag: These plots are too good to be true.
4. Need to better characterize minimum ratio of emittance we can assume.
5. Summary
   (a) Making the proton vertical divergency lower and, ultimately, equal to horizontal divergency can be realized if strong cooling (stronger than assumed presently) becomes feasible.
   (b) Without strong cooling, beam flatness (ratio of vertical to horizontal IP beam size) of ∼0.04–0.05 can get reasonable luminosity with equal or slightly unequal divergencies. But getting such flatness may be problematic because of beam-beam effects (Studies are underway).
6. E.C. Aschenauer: Decreasing vertical hadron divergence to 100 µrad would result in a gain in acceptance of a factor of 2 for a ∼25 % decrease in luminosity (based on slide 4).
7. Red curve [slide 3] assumes stronger hadron cooling than preCDR.

2 All other business

None

3 Draft agenda for Friday, April 24, 2020 from 2:30 to 3:30 p.m.

1. Impact on detector of introducing solenoid field—V. Morozov
2. All other business