

The realization of significant aging affects in the COT has brought into question the appropriateness of the design for the XFT upgrade planned as part of the Run IIb project. The baseline design was chosen to fit within the existing mechanical and electrical constraints, and its performance was predicted based on the presence of four axial layers and one stereo layer. This COT performance may not hold by the time the XFT upgrade is commissioned. Consequently, it is prudent for the collaboration to review the baseline plan, and consider whether alternatives should be explored.

The existing XFT group has a sophisticated simulation that will allow us to understand the baseline performance in a variety of situations. They are currently occupied with the evaluation of the baseline plan in the context of degraded COT performance. They need assistance in considering the strengths and possibilities that alternative algorithms may offer. I am writing to ask you to serve on a Track Trigger Working Group that will consider alternative track trigger strategies that fit within our electrical and mechanical constraints. Your experience with the tracking system may provide a point of view that could be implemented in a triggering scheme, and has not yet been considered.

To provide a benchmark for comparison, the following performance goals have been established for the baseline track trigger. These are felt to be achievable with a fully operational COT in any luminosity we will see.

- $dPt/Pt^2 < 2\%$
- $d(\phi) < 6 \text{ mrad}$
- Efficiency ( $Pt > 7 \text{ Gev}$ )  $> 90\%$
- Cross section of fake tracks ( $Pt > 7 \text{ Gev}$ )  $< 10 \mu\text{barn} + 0.25 * \text{Lumin}/10^{30}$ .

For comparisons, we have chosen the following COT performance scenarios to test the track trigger algorithms:

- Full performance of all layers
- Super layer 2 turned off, super layer 4 at 80% hit efficiency
- Both super layer 2 and 4 turned off

The performance benchmarks and COT scenarios are suggested, and are subject to change if some alternative is thought to better suit to our needs. The most significant electrical constraint is imposed by a desire to use the existing Ansley cables for the trigger data. This cable plant limits the data to the trigger system to 6 bits/wire/396 ns. The original luminosity specification set for the baseline design is  $4*10^{32}$ . However, all triggering strategies should be considered for  $1*10^{32}$  and  $2*10^{32}$  as well.

A review of the track trigger upgrade is scheduled for 14 May. We need to decide on the future direction of this project at that time. I would like a summary of this Track Trigger Working Group's work presented at that review. Towards that goal, we should have a meeting that includes XFT experts in late April to check on the direction of the work. In particular, I would like to see a predicted performance of any alternatives as measured by the track trigger performance goals for the three COT scenarios. I thank you in advance for whatever effort you are able to put towards this issue.