

Minutes of the 16th SiD optimization meeting

26-November-2014

Present:

Tim Barklow (TB)

Tom Markiewicz (TM)

Joel Goldstein (JG)

Marty Breidenbach (MB)

Bruce Schumm (BS)

Jan Strube (JS)

Agenda and Points of discussion:

1. Detector studies in preparation of the workshop (MB)
 - a. Currently the strips of 10 mm length need 4 buffers. ATLAS MAPixels are $\sim 40 \times 500 \text{ um}^2$ and could be thinned to 100 um. This would get rid of the need of multiple buffers, but results in lower pt resolution.
 - TB will check with FastMC on ZH to map out the requirements more accurately.
 - b. Changes of tracker geometry (aspect ratio, etc.) will be decoupled from this and probably not happen in time for Workshop.
 - c. MAP sensors in the ECAL might get rid of the range switching. Studies of the pixel size are needed to find an optimal size.
 - d. Also in the ECAL: Studies by a SLAC summer student indicate that a reduction of the number of active layers from 30 to 25 with the same total thickness might be acceptable. What studies are needed to validate this change?
 - e. HCAL variants: still work in progress. Cost will increase linearly with # connections.

2. Status at UCSC
 - a. currently working on occupancy in Endcaps
 - b. Trying to understand impact of L^* changes
 - beam cal performance
 - background rates
 - c. impact of different crossing angle?
 - d. vacuum pump?
 - e. somewhat stuck with the studies. Needed the following items:
 - Generator of e^+e^- pairs is working more or less
 - Simulation setup including pairs needs support
 - Would like to extract individual background processes from an stdhep file to reduce
 - need to understand how to find the channels and interpret the geometry

ToDo list:

Bruce: produce tables of pt resolution as function of angle and momentum, input to Tim's study.

Jan: take a look at the setup used for simulating the pairs during DBD

all: Take a look at the ECAL study note

https://confluence.slac.stanford.edu/download/attachments/176488486/EMCal_Optimization_for_SiD.pdf?version=2&modificationDate=1411485631000&api=v2

Next week: Produce a list of checkpoints that need to be ticked off before changing the ECAL geometry and / or instrumentation.