Comments from the AFE designers

Maurice – DIFF AFE:

This paper is very good documentation. I have not read yet closely enough to give detailed comments, but because of the political nature I think it is important to add something on power, which is currently very minimal. In the CMS requirements it would be good to indicate that power is not a strong driver for CMS, giving for example what current per channel analog would be within the design cooling margin for the entire detector. Then in the results, only Fig. 16 and its discussion have some information on power, but it is not tied back to any requirement. Other results (such as timewalk) don't indicate what power was used, and I think it would be good to add that in the figures or at least the captions for completeness. This will avoid misunderstandings when comparing to results for low power settings that ATLAS will use, should that comparison arise at some point.

Not implemented: Good point, but as he says the power was not a driver for the CMS requirements, so I think it is not relevant to discuss it in the requirements. I only put requirements that lead to specific measurements. We did not closely monitor the power consumption in the various measurements, so the info is not available and I cannot add it to the figures.

Amanda – DIFF AFE designer :

The paper appears very comprehensive. I will have one or two minor requests, but allow me to read the whole work more closely.

I did not receive more.

Luigi – LIN AFE designer :

Very nice work! For the time being I have just few comments:

- R23-24: "The Linear front-end had the slowest time response"
—> Here I would propose to refer to time-walk performance (instead of maybe a bit generic "time response"). If I remember well, the delay between comparator hit and injection (for a relatively large input signal) is pretty small for the Linear front-end (see attached plot). What is definitely worse for the lin, wrt diff and sync, is time-walk.

DONE.

- R96-97: "by the analogue front-end (AFE), whose basic structure (shown in Figure 3) consists of a preamplifier (PA) and integrator ..."
—> maybe the sentence is somewhat misleading? (one can imagine an additional block, the integrator, after the preamp?). I would propose something like:
"by the analogue front-end (AFE), whose basic structure (shown in Figure 3) includes a charge sensitive amplifier, usually referred to as preamp, ..."

DONE.

Ennio – SYNC AFE designer:

Firstly, thanks a lot for the effort! It is a very complete and well-presented work. I will read it is detail these days and I will send you my more precise comments in the coming days.

I did not receive more.