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Subject: Re: BaBar LAL

Ciao Patrick,

Achille asked me if I could present a summary of the operations tomorrow. As it will probably be difficult for me to connect (there will be some work ongoing in the DIRC tunnel, see below for details), I'm writing down a detailed report here.

The Run 6 integrated luminosity will probably reach 30/fb overnight, roughly 3 months after the official beginning of the data taking (most of January was spent turning on the linac and PEP after the long shutdown). This is obviously very far from the predictions and entirely due to the machine performances as the BaBar detector (and in particular the DIRC electronics) has been working well in 2007. The main detector issues have been related to background (mainly coming from the trickle injection).

The last month has been pretty though, inducing contrasted feelings.

* PEP reached again $10^{34}/\text{cm}^2/\text{s}$ 10 days ago.

* There were 3 long (a few days each) interruptions:

/ one foreseen to relocate water and compressed air pipes (slac-centrally supplied) to make room for the future LCLS tunnel;

/ two unforeseen, the week after the pipe relocation due to a big leak in one of the water pipes (a few meters upstream of the relocated section) and 2 weeks ago because of a vacuum leak in a soldered joint on a flange between

the Q2 and Q4 magnets (HER incoming \Leftrightarrow backward side, in the DIRC tunnel).

* Last Thursday, we had a one shift interruption driven by MCC. They successfully damped a resonance frequency around 9.7 Hz which was making the beams oscillate vertically in the IP region, hence preventing operators from accurately tuning the machine -- see

http://www.slac.stanford.edu/~sullivan/mtg_rpts/BaBar/BaBar_mtg_2007apr20.ppt for details. In addition, they installed a dozen of permanent magnets in the ring which aim at reducing the Low Energy Ring (LER, positron beam) beam vertical size in order to improve the luminosity by 10-20%. Since the completion of this task they are trying to understand the machine which is completely different from before the installation.

Although progresses have been made, they have not been able so far to demonstrate a luminosity improvement, nor even to reproduce the pre-magnet installation performances.

The most recent news is that the flange which was vacuum-sealed earlier in April in the DIRC tunnel seems to be leaking again: beam losses associated with pressure bursts in the nearby gauge have been observed for a few days with increasing frequency. That's not a real surprise because vacseals can hold from a day to years depending on the nature of the leak and on its location.

As MCC needs an healthy machine w/o limitation in current to decide whether the new permanent magnets work or not, it was decided this morning to try to vacseal again the leak tomorrow. On the short term, that means we'll be down for about 10 hours starting 7am: accessing the DIRC tunnel requires to ramp down the magnet and to remove the DIRC shield.

On the longer term, if the new seal doesn't hold better than the current one, we'll have to schedule a 3-5 days down to let MCC remove the new Q4 chamber (installed last Fall) to put in again the old chamber which shouldn't be able to hold more than ~ 2 Amp in the HER.

As we didn't come close to that current yet, this shouldn't be an immediate issue. The other possibility would be to have the new chamber fixed in a slac workshop before being put back in the DIRC tunnel but that would take more time and the probability to make a mistake under pressure is not negligible.

In short, Run 6 is 'closer' to Run 5 (except for its last few weeks) than to Run 4 for what concerns the machine progresses. Assuming we run until end of September (it is still not clear when the 3 months shutdown will start; it is currently scheduled for September-November but rumors say it could be delayed by a month to make sure LCLS is ready), hence 5 more months,

Run 6 should accumulate in total 105-155/fb assuming a future monthly average integration of 15-25/fb (best month is currently ~17/fb overall, ~12/fb for Run 6). Past performances make the lower bound currently more realistic than the upper one; PEP prevision was 180/fb with the down starting in September.

Cheers,

Nicolas