

LHC June 2012 Update

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Abstract

This news is adapted from viXra log (<http://blog.vixra.org>) and contains LHC updates through June 30, 2012. LHC has collected all it can for the ICHEP conference in July. The amount delivered is 6.6/fb, just a shade short of the projected figure of 6.8/fb and well over the 5/fb target, so they have done very well. While we wait for ATLAS and CMS to deliver their latest results the LHC has reawakened from a week-long technical stop and is once again injecting beams.

Key Words: LHC update, June 2012.

June 19, 2012: [Yet Another LHC Update](#)

The Large Hadron Collider has now entered a Machine-Development/Technical-Stop phase that will last eleven day. That means they have collected all they can for the ICHEP conference in July. The amount delivered is 6.6/fb, just a shade short of the projected figure of 6.8/fb and well over the 5/fb target, so they have done very well. As usual it was not easy with many problems holding down run efficiency but in the last week they amassed an impressive figure of 1.3/fb to make up for some time lost at the beginning of this run. They have two more runs of similar length to the last so they are well on the way to reaching the 13.3/fb figure that was given as the amount needed to ensure that both experiments can independently discover or rule out the Higgs Boson. They should also have time to complete other priority tasks before the long shutdown next year, such as testing runs with 25ns that will be needed when they restart at 13 TeV.

Now it is over to the experiments to see what they can achieve in time for ICHEP which starts in just 15 days time. ATLAS has recorded 6.23/fb and CMS has 6.15/fb and they have already been beavering away with the first chunk of this data. There is some chance that they can get to the critical 5-sigma level for independent Higgs discoveries (For the (well-meaning) nit-pickers I mean discovery of a neutral boson resonance (probably) consistent with the standard model Higgs, sigh) Contrary to what some blogs are saying it is no more difficult to combine the 7 TeV and 8 TeV data than it is to combine all the different channels, and whether or not they do this could be largely a political choice depending on how and where they want the discovery announcement to be made. However, time constraints could also be critical. It will be tempting for them to try to use as much of the 6/fb of data as possible for the Higgs search but that will require maximum computing resources. They may have to face a difficult choice between getting discoveries in the Higgs search in time for ICHEP or looking for other searches for more

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exotic physics. If it comes to that face-off my bet would be on them prioritising the Higgs search, but whatever the outcome it will be an enthralling conference.

I should also mention that LHCb have 0.65/fb added at 8 TeV so good progress there as well. By the way, viXra Log has made it into the [final](#) of this years science blog contests at 3 Quarks Daily. It is up to Sean Carroll to pick the three winners. Now I wish I hadn't said all those bad things about him, perhaps he didn't notice.

June 30, 2012: [LHC on the run again](#)

While we wait for ATLAS and CMS to deliver their latest results the LHC has reawakened from a week-long technical stop and is once again injecting beams. It could take a few days before they are back to collecting data at full luminosity. This run will last 6 weeks and will be interrupted by TOTEM physics, floating MDs and VdM scans leaving about 4 to 5 weeks for normal running. The previous run that delivered about 5.5/fb lasted 7 weeks so there is less time in this run. Bunch intensities will however be increased beyond the already impressive figure of 150 billion protons per bunch, remember that the LHC was designed to reach a nominal maximum of 115 billion ppb but there is an ultimate maximum of 170 billion ppb because they are running with a lower 50ns bunch spacing.

One consequence of such high beam intensity is that some parts of the LHC are feeling the heat. The kicker magnets [have warmed up](#) to 70 degrees centigrade during long runs and the control centre needs to wait for them to cool down before they can start a new fill. Despite such difficulties and the shorter time I am sure they will be hoping to at least match the 5.5/fb delivered in the last run. After that there will be another technical stop followed by a final proton run. All being well the total data delivered should be enough to bring out some detail in our view of the Higgs boson, and perhaps it will also show us something else new.

References

1. <http://blog.vixra.org/2012/06/19/yet-another-lhc-update/>
2. <http://blog.vixra.org/2012/06/30/lhc-on-the-run-again/>