

Simulations and software tools for the CMS Tracker at SLHC

Tuesday, 24 March 2009 08:00 (20 minutes)

The luminosity upgrade of the Large Hadron Collider (SLHC) is foreseen starting from 2013. An eventual factor-of-ten increase in LHC statistics will have a major impact in the LHC Physics program. However, the SLHC as well as offering the possibility to increase the physics potential will create an extreme operating environment for the detectors, particularly the tracking devices and the trigger system. An increase in the number of minimum-bias events by at least an order of magnitude beyond the levels envisioned for design luminosity creates the need to handle much higher occupancies and for the innermost layers unprecedented levels of radiation.

This will require a fully upgraded tracking system giving a higher granularity, while trying not to exceed the material budget and power levels of the current system, and a revision of the current trigger system. Additional trigger information from the rebuilt tracking system could reduce the L1 trigger rate or could be used earlier in the higher level triggers. Detailed simulations are needed to help in the design of the new Tracker and to study the possibility of including tracking information in the L1 trigger system. At the same time, the huge increase in pile-up events

imposes sever constraints also in the existing software that needs to be optimized in order to produce realistic studies for SLHC. This will require a fully upgraded tracking system giving a higher granularity, while trying not to exceed the material budget and power levels of the current system.

Detailed simulations are needed to help in the design of the new Tracker and to study the possibility of including tracking information in the L1 trigger system. At the same time, the huge increase in pile-up events imposes sever constraints also in the existing software that needs to be optimized in order to produce realistic studies for SLHC.

Summary

The talk will deal with the software and simulation development for the study of a new CMS Tracker layout at SLHC.

Primary authors: Dr TRICOMI, Alessia (University and INFN Catania); Dr HARDER, Kristian (RAL)

Presenter: Dr HARDER, Kristian (RAL)

Session Classification: Poster session

Track Classification: Event Processing