

The CMS Level-1 Trigger Upgrade

The LHC RUN2 which has just started marks the beginning of a new era. It is expected that the integrated luminosity delivered by LHC will increase markedly and this will open new opportunities for discoveries as well as for precision measurements. The increased luminosity presents a challenge for the CMS Level-1 trigger system which is being upgraded to cope with the new LHC environment which is characterized by large detector occupancies caused by a dramatic increase of the pile-up events. The new CMS Level-1 trigger presented here is based on uTCA technology, Xilinx Virtex-7 690 FPGAs and 10 Gbps optical links. The Level-1 trigger upgrade will provide initially for electron/photon and tau triggers of increased efficiency and better background rejection as well as for pile-up subtraction for all triggers. This system will be upgraded further in 2016 and will be able to process data at full detector granularity by employing the novel Time Multiplexed Trigger (TMT) architecture. The TMT architecture provides for dramatic increase of energy and position resolution of all Level-1 trigger objects. The design and performance of this system using the first data from RUN2 are presented here.

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