Contribution ID: **1**   Type: **Poster**

Upgrade of the Muon Sorter in the Cathode Strip Chamber Level 1 Trigger System at CMS

Tuesday 24 September 2013 18:25 (1 minute)

We report the results of our efforts in the past year to upgrade the Cathode Strip Chamber (CSC) Muon Sorter at CMS. After presenting an overview of the existing CSC Track Finder hardware and upgrade requirements we describe the modification of the existing board and transition to a new Muon Sorter. Then we discuss the improved sorting algorithm and its inplementation in firmware. Current status and future plans are outlined in the conclusion.

Summary

The top level of the Level 1 Trigger System in the Cathode Strip Chamber (CSC) detector at CMS consists of the Track Finder (TF) crate with 12 Sector Processors (SP) and one Muon Sorter (MS) board. The MS provides sorting of up to 36 trigger objects from the SP boards, selects the four best (by a definable criterion) ones, and transmits then to the Global Trigger crate of CMS. With the anticipated LHC luminosity increase above $1034cm-2s-1$ at higher energy of 6.5-7 TeV/beam the CSC TF needs to be upgraded. The new CSCTF will be robust to higher occupancies, provide improved transverse momentum assignment and increased precision of the muon output variables. A transition from the current 9U VME electronic standard to the more flexible uTCA and utilization of the Xilixn Virtex-6 and Virtex-7 FPGAs, with multiple embedded gigabit links, will allow us to build a higher performance TF such that the MS functions can be performed by one of the SP modules. We present here the results of our efforts in the past year to upgrade the CSC Muon Sorter, including the short term modifications of the existing VME board, long-term transition to the uTCA as well as firmware development for both of these projects.

Primary author: MATVEEV, Mikhail (Rice University)

Co-authors: Mr MADORSKY, Alex (University of Florida);   Mr ACOSTA, Darin (University of Florida);   Mr FURIC, Ivan (University of Florida);   Mr LIU, Jinghua (Rice University);   Mr ECKLUND, Karl (Rice University);   Mr PADLEY, Paul (Rice University)

Presenter: MATVEEV, Mikhail (Rice University)

Session Classification: Poster