

Abstract Submitted  
for the APR07 Meeting of  
The American Physical Society

**Online Laser Monitoring for the CMS electromagnetic calorimeter: 2006 Test Beam Results** CHRISTOPHER ROGAN, California Institute of Technology, CMS COLLABORATION — The Compact Muon Solenoid (CMS) experiment is a general-purpose particle physics detector designed to exploit the physics of p-p collisions at a CM energy of 14 TeV at the Large Hadron Collider (LHC). The CMS electromagnetic calorimeter (ECAL) is composed of 76,000 lead tungstate ( $\text{PWO}_4$ ) crystals. Although radiation resistant, light output of  $\text{PWO}_4$  crystals displays a loss caused by the creation of color centers, which absorb a fraction of transmitted light. Subsequent recovery occurs due to color center annihilation, leading to periodic, dose-rate dependent light output variations. A laser based light monitoring system is designed to track variations of crystal's transparency and provide corrections for precision inter-calibrations, which are crucial for the CMS physics program. Crystal transparency is measured using laser pulses injected into the crystals via optical fibers. The laser monitoring system includes a blue light source and an optical fiber based light distribution system with reference PN diode readout. An online monitoring data analysis system was developed for the 2006 test beam effort, allowing variations in crystal transparencies to be analyzed in a quasi real-time. This talk describes software and DAQ infrastructure of the online monitoring data analysis system and its performance. The monitoring stability will also be discussed.

Christopher Rogan  
California Institute of Technology

Date submitted: 07 Jan 2007

Electronic form version 1.4