Abstract Submitted
for the SES11 Meeting of
The American Physical Society

Lifetime Performance Studies on Vacuum Photo-Triodes in the ECAL at CMS JOHN WOOD, University of Virginia, CMS COLLABORATION — The electromagnetic calorimeter (ECAL) is a crucial sub-detector of the Compact Muon Solenoid (CMS) at the Large Hadron Collider (LHC). It uses scintillation light fr om approximately 83,000 Lead Tungstate ($PbWO_4$) crystals to make precision measurements of high energy photons and electrons. In the endcaps of the ECAL this scinti llation light is collected at the rear of the crystal and converted to an analog electric current with radiation hard, single stage photmultipliers known as Vacuum Pho to-Triodes (VPTs). The response of the VPTs is dependent on several effects including orientation within the magnetic field, calibration and scintillation light expos ure rates, and time between successive exposures. The High Energy Physics group at the University of Virginia (UVa) uses a 3.8 T large-bore superconducting solenoid m agnet to simulate conditions at the LHC and to study the long term behavior of these VPTs under various light and magnetic field conditions. Also, using the ECAL lase r and LED calibration system, UVa is also able to study the response of the VPTs in situ at the CMS detector in order to understand and quantitatively assess the perfo rmance of the VPTs over time. Herein we will report on these remote and in-situ studies of VPT characteristics and performance.

John Wood
University of Virginia

Date submitted: 25 Aug 2011 Electronic form version 1.4