Contribution ID: **55** Type: **Poster**

The stability of vacuum phototriodes to varying light pulse loads and long term changes in response

Thursday 14 June 2012 15:30 (40 minutes)

Vacuum Phototriodes (VPTs) are radiation resistant photodetectors, designed to operate in a strong quasi-axial magnetic field. This paper reports the long and short term changes in response of production vacuum phototriodes to pulsed light for devices installed in the CMS experiment at the CERN LHC. Both long and short term dynamic effects occur because of pulse rate changes during LHC operation and the effect of increasing integrated charge taken from the photocathode. We have investigated these effects over time periods exceeding two years of simulated operation and discuss the implications for the long term performance of the VPTs in CMS.

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Session Classification: Posters B