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Multianode Photomultiplier Testing for 2013 CMS Hadronic Forward (HF) Upgrades GARRETT FUNK, ZHE JIA, YASAR ONEL, University of Iowa, CMS COLLABORATION — The Hadronic Forward (HF) section of the Compact Muon Solenoid, a detector at the Large Hadron Collider at CERN, will undergo various upgrades in 2013. HF requires photomultiplier tubes (PMTs) to detect the energy signatures of hadronic collisions. The University of Iowa High Energy Physics group is responsible for testing new PMTs for the upgrade. These tests provide seven different operational parameters that will be used for calibration and quality control before installation. The dark current test checks the noise generated by the PMTs at different voltages when there is no light source. The after pulse test measures the degradation of the vacuum chamber of each PMT as it relates to pulse noise. The gain test measures the degree of amplification provided by the PMT. This is the most vital test, as it allows for the reconstruction of the energies observed by the PMT. The surface non-uniformity test checks the active face of the PMTs for signal uniformity and “hot spot” sensitivity to light. The timing test observes the PMT’s reading and recovery speed. The linearity test measures the tube’s output under varying levels of light. The double pulse test checks the linearity of the PMT with two signals occurring 25 nanoseconds apart.

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