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Study of the crystal transparency changes of the CMS ECAL CAROLINE SOFIATTI, University of Massachusetts Boston, CMS-CALTECH COLLABORATION — The Compact Muon Solenoid (CMS) is a general purpose detector installed at the Large Hadron Collider (LHC) at CERN, Geneva. Detection and precise energy measurement of photons and electrons is a key to new physics that is expected at the 100 GeV - TeV scale. Additionally, the discovery of the postulated Higgs boson is a primary goal at LHC and $H \rightarrow \gamma \gamma$ is the most promising discovery channel if the mass is between 114 and 130 GeV. In this mass range the Higgs decay width is very narrow, but the signal will lie above an irreducible background and so good energy resolution is crucial. A photon energy resolution of 0.5% above 100 GeV has therefore been set as a requirement for the CMS performance. Light monitoring the transparency changes in the lead tungstate crystal plays a crucial role in maintaining the energy resolution for the CMS ECAL at LHC. This work presents the preliminary studies of the transient transparency changes of the crystals. Ultimately, this study will be used to implement an upgraded correction algorithm that will optimize the CMS discovery potential, particularly in the di-photon search channels.

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