

Abstract Submitted  
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**R&D Studies on Radiation Hard Wavelength Shifting Fiber for CMS Hadronic Endcap Calorimeter Upgrade** JOHN NEUHAUS, University of Iowa — The Hadronic Endcap (HE) calorimeters of the CMS experiment cover the pseudorapidity range of 1.4 to 3 on both sides of the CMS detector, contributing to superior jet and missing transverse energy resolutions. As the integrated luminosity of the LHC increases, the scintillator tiles used in the CMS Hadronic Endcap calorimeter will lose their efficiency. Here, we propose to replace the scintillator tiles in high radiation area with “radiation hard” quartz plates. To increase the light collection efficiency, the generated Cerenkov photons are collected by UV absorbing wavelength shifting (WLS) fibers. Our previous study has shown that quartz plates and plastic wavelength shifting fibers can be used as an effective calorimeter. However there is no radiation hard WLS fiber commercially available. Here we summarize the R&D studies on constructing a radiation hard WLS fiber prototype in University of Iowa CMS Laboratories. The results from the tests performed on quartz fibers treated with p-Terphenyl, as well as the Geant4 simulations of this prototype are presented.

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