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The Zero Degree Calorimeter for CMS. JEFF WOOD, University of Kansas, CMS COLLABORATION — The Zero Degree Calorimeter (ZDC) is a device currently in the construction stages for use in nuclear research at the Large Hadron Collider (LHC) which is expected to operate by 2007. The ZDC will be used for both particle physics and nuclear physics research is scheduled at LHC. The ZDC itself will consist of plates at 45 degree angles relative to the beam and will be made of tungsten. Between these plates, there are plates of fiber optics that collect light. The events from colliding beams within the ZDC release Cherenkov light which the fibers then pick up. These many fibers will be fed into a photomultiplier tube with a time resolution of about 25 nanoseconds, the period at which events are expected. One of the problems discussed shall be the tendency of the quartz-based optical fibers to darken over time, so calibration is also necessary. The calibration mechanism will involve injecting a known amount of light into the ZDC itself so that a comparison can be made with the amount of light that is received by the photomultiplier tube. The challenge is creating an injection system resilient enough to withstand a highly radiative environment that will be also compatible with the resolution of the photomultiplier tube.

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