Mechanical design and testing of scintillation detector modules

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Abstract

We describe in this work the mechanical design of scintillation detectors used to count particles. The mechanical structure of these detectors is basically built to hold 64 plastic scintillators (4 m long), wave-length shifter optical fibers, and photomultiplier tubes. Basically, the detectors have a 9 m $\times$ 1.4 m modular design composed by a PVC casing to contain and to hold 64 plastic scintillator strips, WLS optical fibers, a 64 multi-anode PMT, and the electronics front-end. These modules are designed to be easy to handle and to transport, rugged enough to resist underground deployment, and to have light and water tight seals. We also show the mechanical testing procedure performed to each module to achieve the water tightness specifications.