

## **BUTTON WbLS Detector development at Boulby underground Lab**

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BUTTON is a water medium scale WbLS and Cherenkov technology testbed. It is designed to prove the capabilities of advanced photosensors and fill media including water based liquid scintillator (WbLS) in a low background facility. BUTTON features a volume of  $30 \text{ m}^3$  which has been designed with specially compatible materials for use with Gadolinium (Gd) doped water, WbLS and also Gd doped WbLS. The experiment is under construction over a km below sea-level in a deep underground lab on the east coast of England. The design of this experiment has been driven by flexibility allowing replacement of PMT modules with future advanced photosensors, fill materials and insertion of a multitude of calibration devices. These advancements can inform the design of future water Cherenkov or exotic fill neutrino detectors for nonproliferation or astro/particle physics applications.

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