Lake Deployment of Southern Wide-field Gamma-ray Observatory (SWGO) Detector Units

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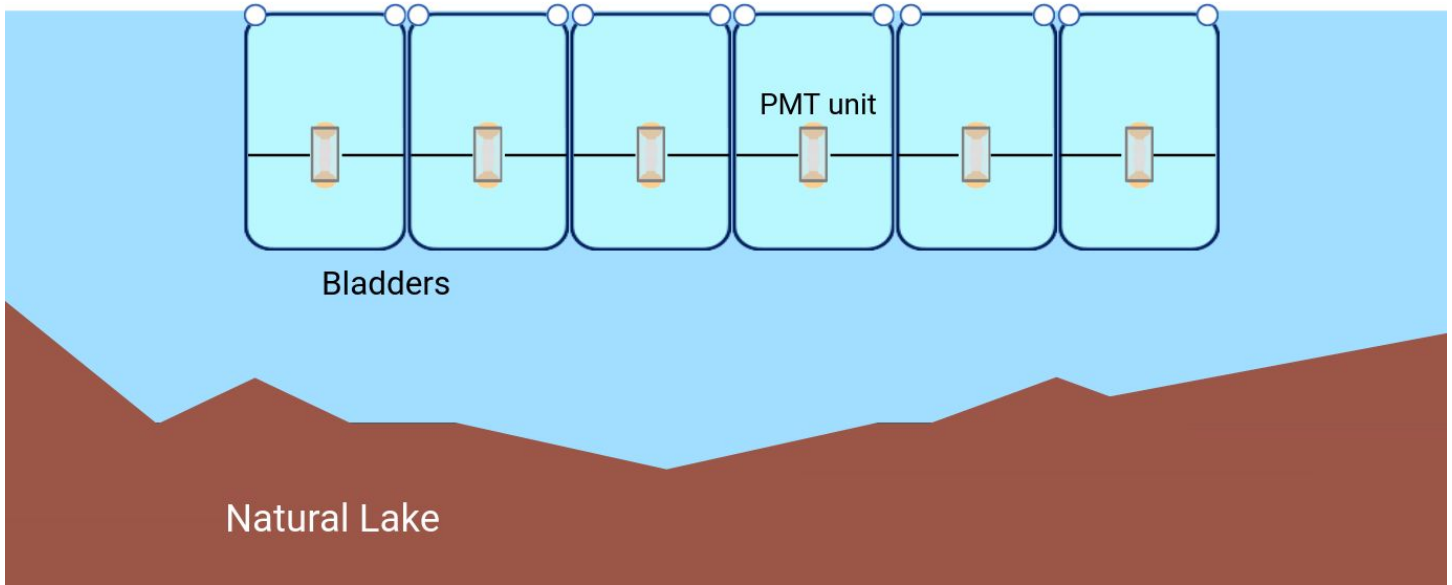
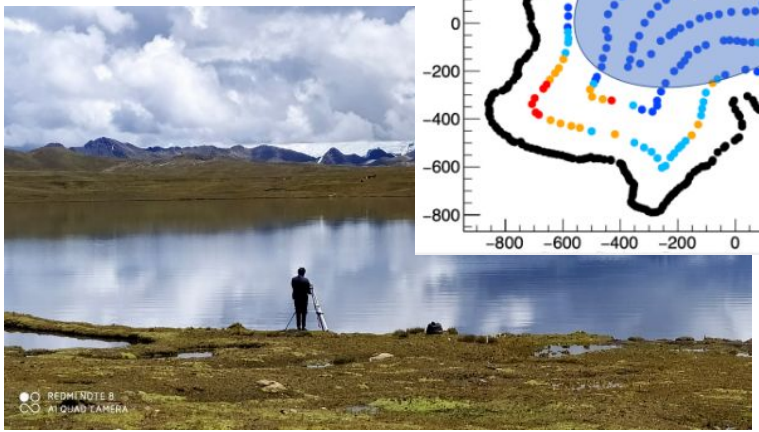
Lake Design

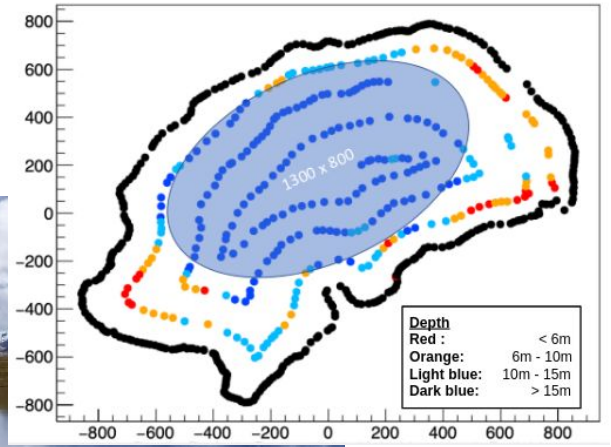
- The Lake design is one of the alternative designs
- Bladders filled with clean water are deployed near the surface of a natural lake
- Each bladder is a light-tight stand-alone unit containing photosensors



Lake Site

- Three lake candidates in Peru
- Depth survey conducted
- Suitable for a 1 km^2 array of bladders





Initial Tests

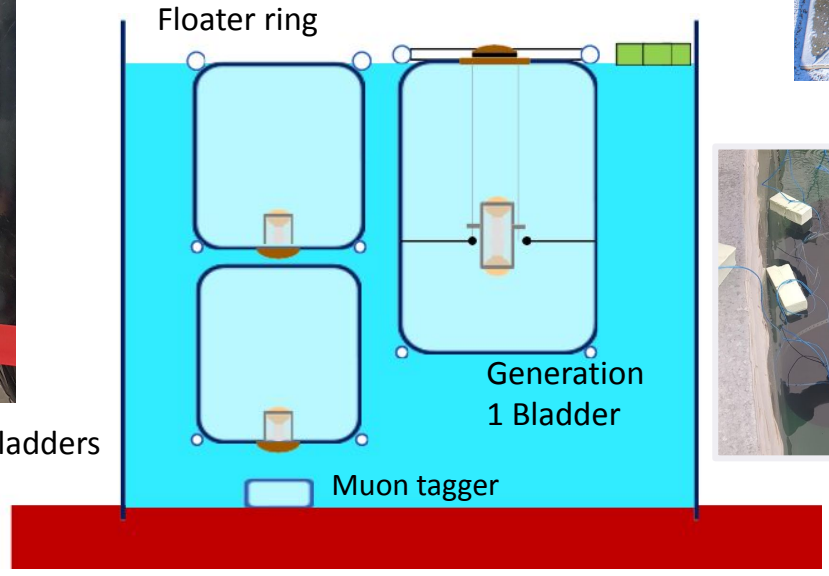
Tests with small transparent bladders

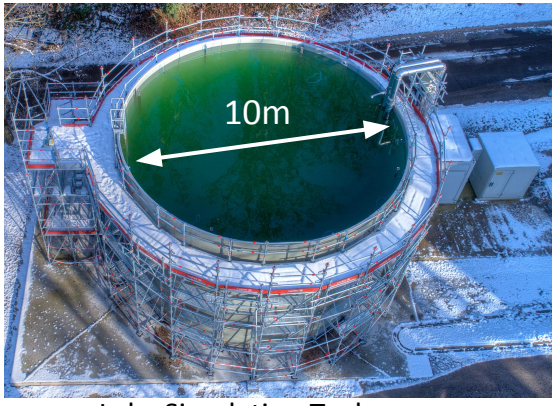
- Mechanical stability
- Behavior under waves & impact
- Different water fill levels

Testing of Prototypes

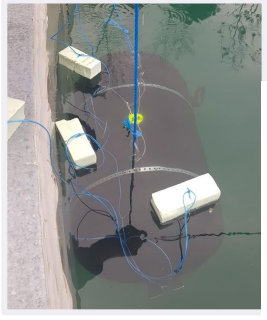
- Larger prototype bladders manufactured
- Testing in a 7m lake simulation tank

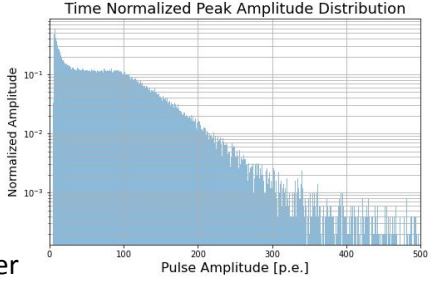
Generation 0 Bladders





Lake Simulation Tank

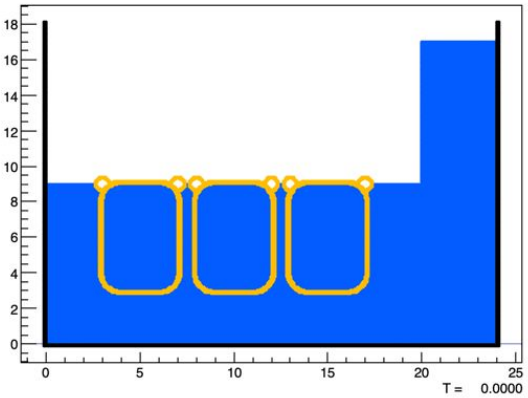




Muon tagger measurements

Hydrodynamics Simulations

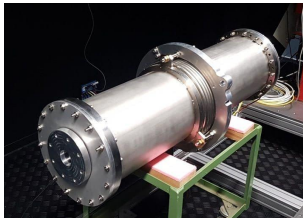
- Determine wave loads on bladders and the resulting strength requirements
- Smoothed particle hydrodynamics (SPH) methods

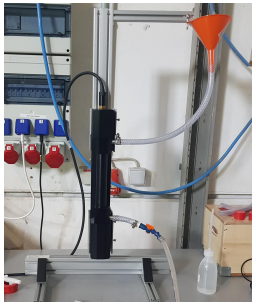


Material Tests

Wavelength-dependent integrated reflectivity

Light tightness test of materials with a PMT





Water transparency monitoring at 400 nm