



Contribution ID: 49

Type: **Parallel Presentation**

## **Material Development and Prototype Study for Large-scale Liquid Detector**

*Tuesday, November 19, 2024 3:15 PM (15 minutes)*

Water-based Liquid Scintillator (WbLS) is an innovative material for constructing large-scale detectors in neutrino and dark matter research. The tunable light yield, enabled by an inline circulation system, allows for flexible detector optimization for different physics searches. With adequate photosensor coverage, detecting low-intensity light can reconstruct the momentum of energetic charged particles while enhancing sensitivity to low-energy events, thereby improving background suppression in kiloton-scale neutrino detectors. Adding metallic elements like Gadolinium further enhances WbLS as a candidate for outer detectors optimized for neutron background tagging. A 30-ton WbLS demonstrator has been constructed at Brookhaven National Laboratory (BNL) to assess its stability, optical properties, and circulation process, providing valuable insights for designing large-scale detectors. Preliminary data and plans for investigating WbLS stability and performance will be discussed in this talk.

**Primary author:** WANG, Ryan (University of Alabama)

**Co-authors:** YANG, Guang (Brookhaven National Lab); Dr DIWAN, Milind (Brookhaven National Laboratory); Dr YEH, Minfang (Brookhaven National Laboratory)

**Presenter:** WANG, Ryan (University of Alabama)

**Session Classification:** RDC 09 - Calorimetry Parallel Session

**Track Classification:** RDC Parallel Sessions: RDC9: Calorimetry