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# BUTTON and Beyond: Integrating Novel Technologies in RATPAC for Precision Neutrino Detection

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Next-generation neutrino detectors will require new simulation and reconstruction software. For water and scintillator-based neutrino detectors, RATPAC is a leading simulation framework. The latest release, RATPAC-two, brings several enhancements over the original version, improving both the usability and collaboration potential between experiments. With the 30-tonne BUTTON experiment at Boulby Underground Laboratory about to begin operations, direct comparisons between data and simulation are now feasible. This talk will highlight the integration of novel technologies, including Water-based Liquid Scintillators (WbLS) and Large Area Picosecond Photodetectors (LAPPDs), within the RATPAC framework. These innovations hold significant promise for improving the precision of neutrino measurements in the few MeV range, particularly for sources such as reactors and core-collapse supernovae. Starting with BUTTON, the WbLS program at Boulby lays the foundation for a potential 1-kton WbLS neutrino detector and future dark matter experiments.

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