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In-situ Calibration Techniques at TRIDENT

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Accurate reconstruction of neutrino–nucleus interaction events is essential for studies of the high-energy Universe and fundamental physics at TRIDENT. The TRIDENT detector will be deployed in the South China Sea, where the seawater environment introduces additional systematic uncertainties to neutrino detection. This talk presents a suite of in-situ calibration techniques developed to constrain detector systematics while minimising experimental downtime. By performing in-situ calibrations, these methods enable real-time monitoring of key parameters, including the water attenuation length and detector orientations, under dynamically changing conditions. The calibration strategies and the achieved measurement precisions are discussed.

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