



Tide gauge calibration at Macquarie Island using GPS buoy techniques

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Macquarie Island, located in Australian sub-Antarctic waters (54° 30' S, 158° 57' E), represents one of the few possible locations in the Southern Ocean to observe sea level using traditional tide gauge techniques. The wave and atmospheric climatology of the region, coupled with a rugged coastline, makes the operation of a modern tide gauge installation extremely difficult. To overcome many of these difficulties, an acoustic gauge is operated within an inclined shaft drilled through a coastal rocky outcrop. Issues surrounding the calibration and vertical datum control of this gauge are therefore unique and require special consideration to enable the calculation of absolute sea level at the Island. We present initial results from a novel application of GPS buoy techniques to the calibration task at hand. The methodology represents a new application of the technology, maximising the oceanographic and geodetic value of this remote observing station.