

# An IR Photonic Type HLS system developed at NSRRC

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A simplified hydraulic levelling system (HLS) developing project has been carried out to monitor the ground settlement of TPS tunnel within 10  $\mu\text{m}$  resolution in these years. An IR photonic type integration was proposed to meet the requirement. This design consists of simple circuits with separated IR led and phototransistor to sense the water surface variation inside a small chamber installed on the ground. Through different sensing combinations assembled with several chamber types, a series of tests had been performed to examine the measurement range, linearity, resolution, etc. Eventually, an improved model consists of a chamber with three measuring cells is able to expand the sensing range to 10mm with 1 $\mu\text{m}$  passible resolution. This system is under data communication test and will be manufactured next year. This paper presents the system design and testing results.

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