Temasek Defence Systems Institute

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MICROWAVE-PHOTONIC ARCHITECTURE FOR DIRECTION FINDING OF LPI EMITTERS: POST-PROCESSING FOR ANGLE OF ARRIVAL ESTIMATION

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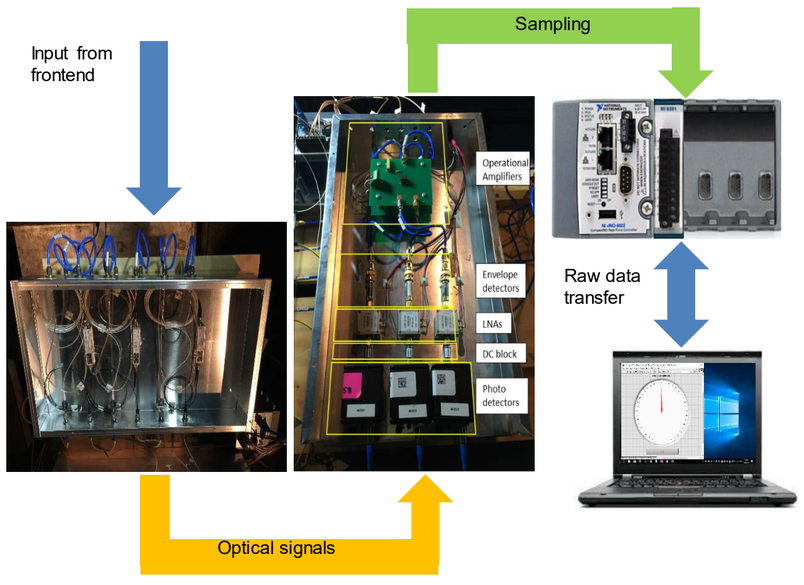
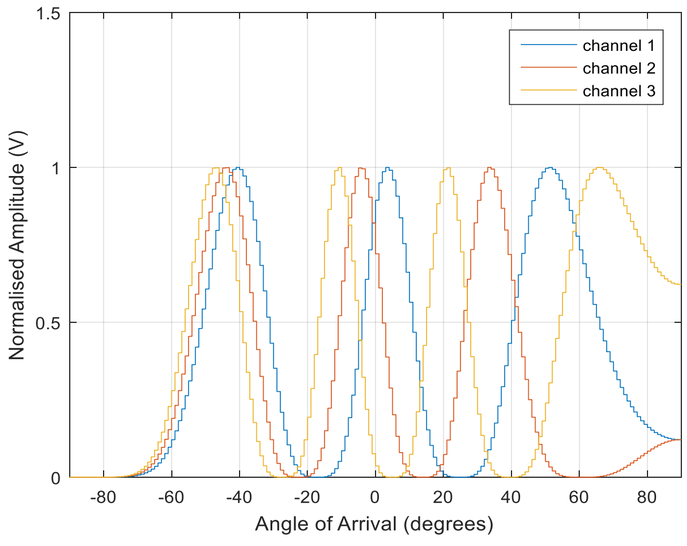
Content:

- An innovative design of a microwave-photonic direction finding technique for the detection and direction finding of low probability of intercept (LPI) signals is investigated in this thesis.
- A unique phase encoding method is used to resolve the ambiguities over the entire field-of-view with high accuracy.
- Experimental tests using frequency-modulated continuous wave (FMCW) and continuous wave (CW) P4 modulated signals were conducted in an anechoic chamber to verify the system design. Test results showed that the microwave-photonic DF system has a sensitivity of –62.96 dBm and is capable of measuring the angle-of-arrival (AOA) of the LPI signals with <1° resolution over a 180° field-of-view
- Primary follow-up research activities include multiple emitters detection and improving the sensitivity of current design.

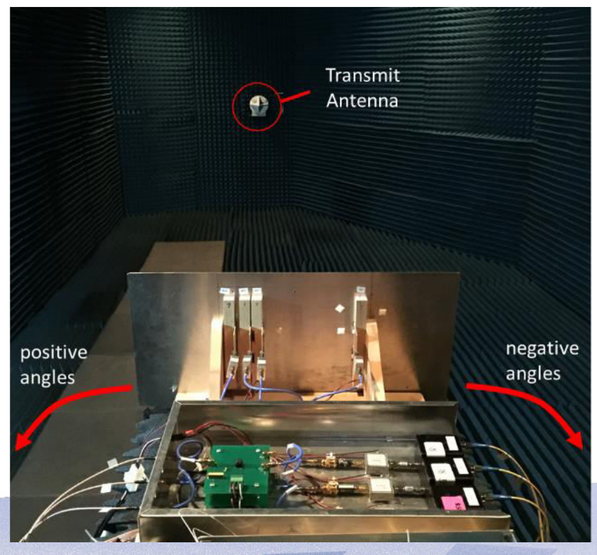
Hardware Design



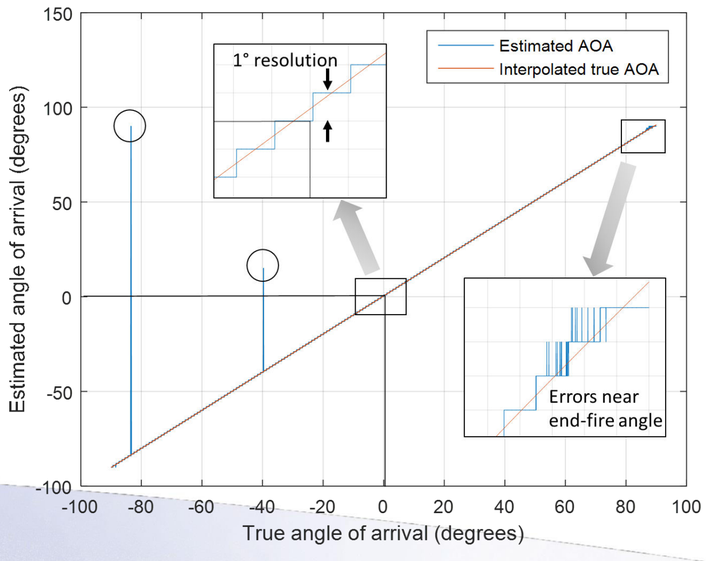
System Simulation



Experimental Tests



Experimental Results



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