

Link Synchronization Based on the Burst Detector

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Outline

- There is a focus on utilizing pulse shape link synchronization signaling
- A relevant proposal can be found in [Lo_3dm_01_050125.pdf](#)
- This presentation examines the performance of this type of link detection
- Our simulation showed that a Burst detection is very robust even with high frequency offset

Overview of signaling

- One of pulse based link synchronization scheme is described in [Lo 3dm 01_050125.pdf](#)

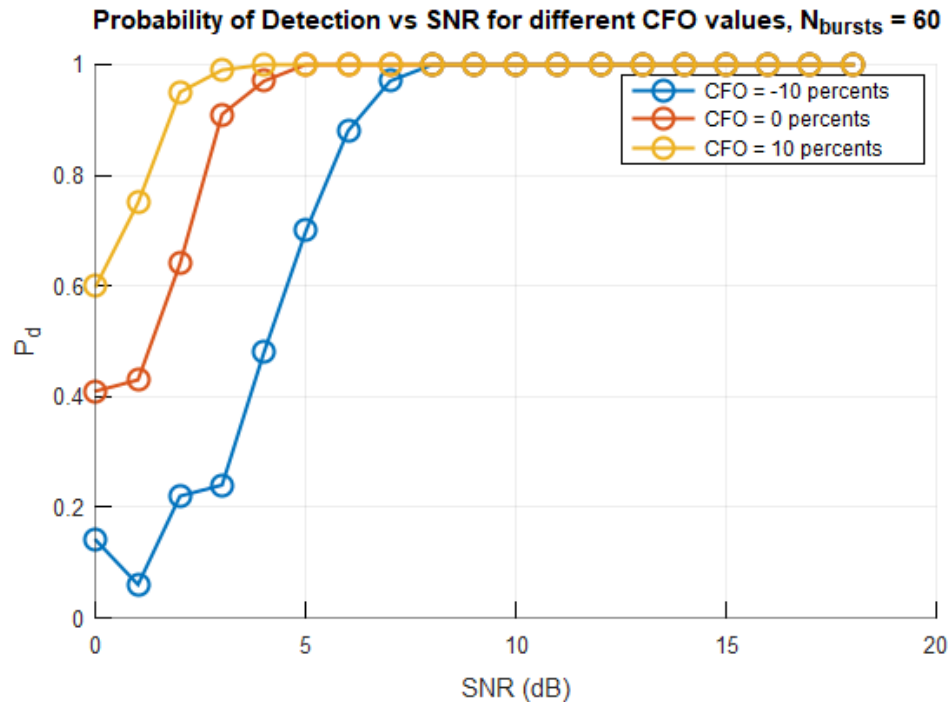


- In low data rate path, each pulse is 4 symbols of Manchester code over 192 symbol long period

Simulation Parameters

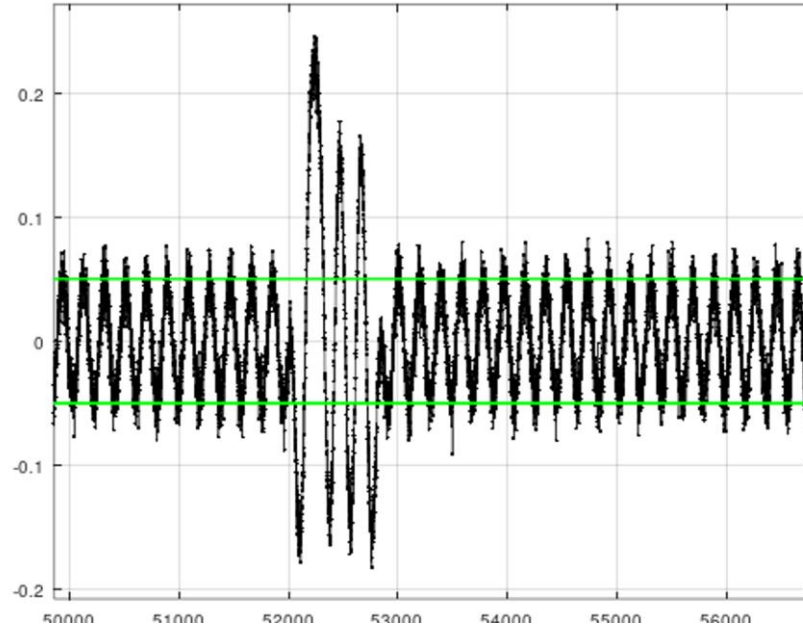
- The simulation uses a 15m STP cable, representing the worst-case channel scenario.
- Frequency offset of $\pm 20\%$ is applied
- To evaluate false positives, the following signals are considered:
 - Additive white Gaussian noise
 - Low data rate SEND_N using Manchester coding
 - EMI sinusoid signal

Detection Probability in Crystal-less Mode



The signal remains detectable despite a significant frequency offset

No False Positives with High-level of in-band EMI



Summary and future actions

- Our simulation demonstrated that burst detection is highly reliable.
- The goal is to identify pulses in each direction that can be easily distinguished.
- For the low data rate direction, DME at 117 MHz is a suitable option.
- For the high data rate, the right pulse should be introduced



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