

## **Analysis of Code Multiplexed Read Out for Focal Plane Arrays**

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### **ABSTRACT:**

Affordable, compact laser radar (LADAR) technology is currently being researched at the Army Research Laboratory (ARL). LADARs operate similarly to radar except that a LADAR illuminates a scene with a modulated laser beam instead of a modulated radio signal. Illuminating at laser frequencies enables the LADAR to achieve a high angular resolution from a small aperture, while modulating the laser beam enables the LADAR to achieve high range resolution. The combination of high angular and range resolution allows the LADAR to form near optical quality 3-D images of objects at substantial ranges. As with any detector system, however, the current ARL LADAR setup has some issues with signal noise. In order to improve ARL's modulated LADAR system, some work had been done to reduce "cross-talk" – noise in the code introduced by interference somewhere in the experimental setup. Changes in the hardware partially solved the issue, but limited work had been done to study the effects of encoding the data differently or using filters to "clean" the signal. My work this summer with Dr. Stann, Dr. Redman and Dr. Ruff involved a study on the methods used to encode the data signals, the length of those codes, and the simulation of various bandwidth filters through LabView™ in order to find a software solution to the signal noise in ARL's CHAMP LADAR system.

**KEY WORDS:** LADAR, Walsh-Hadamard, Pseudo-Noise, Bandwidth filters

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