# Experiment of Refining Six Channel Reconstruction

May 26, 2018

## 1 Introduction

In this document, I will record the experiment procedure of refining the six channel single shot multispectral reconstruction.

## 2 Reconstruction of simulation

The results from simulated snapshots show significant color shift due to false first channel reconstruction. The reconstruction is built on simulated ring PSFs. The PSFs is $51 \times 51$ and the ring width is one pixel. One hypothesis of the source of error is that the over-simplified rings would mislead the algorithm. Another hypothesis is that the existance of central peak, which appears in the imaging setup, benefits the restoration of sharp images. In this experiment, I would like to test the source of error.

### 2.1 Experiment procedure

#### 2.1.1 Ring PSFs wider than single pixel

- Design ring PSFs of larger dimension, for example $81 \times 81$, both single pixel and wider
- Pad image edges
- Reconstruct results from single pixel ring PSFs

- Reconstruct results from wider ring PSFs
- Compare

#### 2.1.2 Ring PSFs with central peak

- Design ring PSFs with central peak
- Reconstruct results from PSFs with central peaks
- Reconstruct results from PSFs without central peaks (if data lost)

# 3 Reconstruction of real-world scene