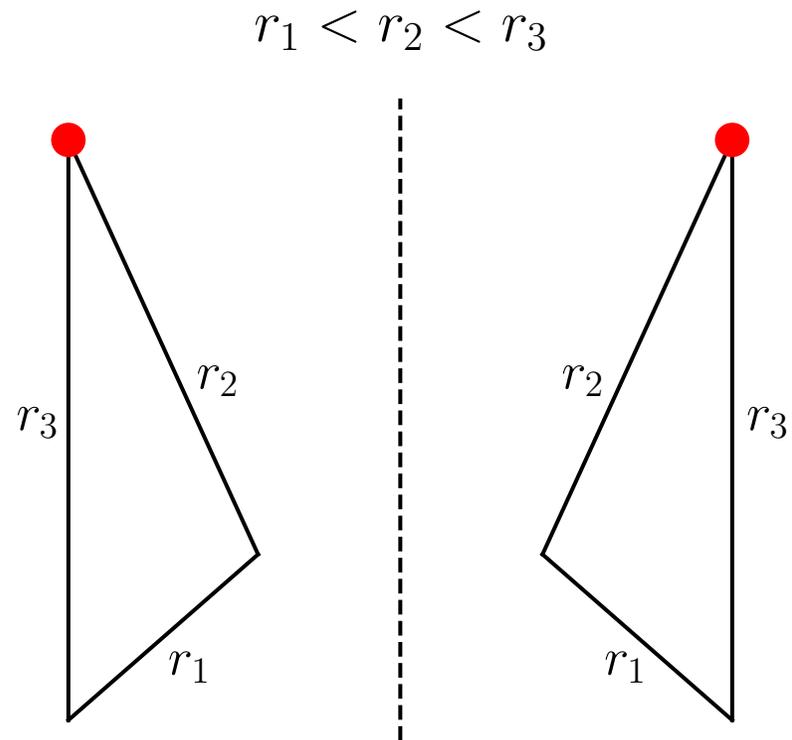


Unsupervised Searches for Parity Violation

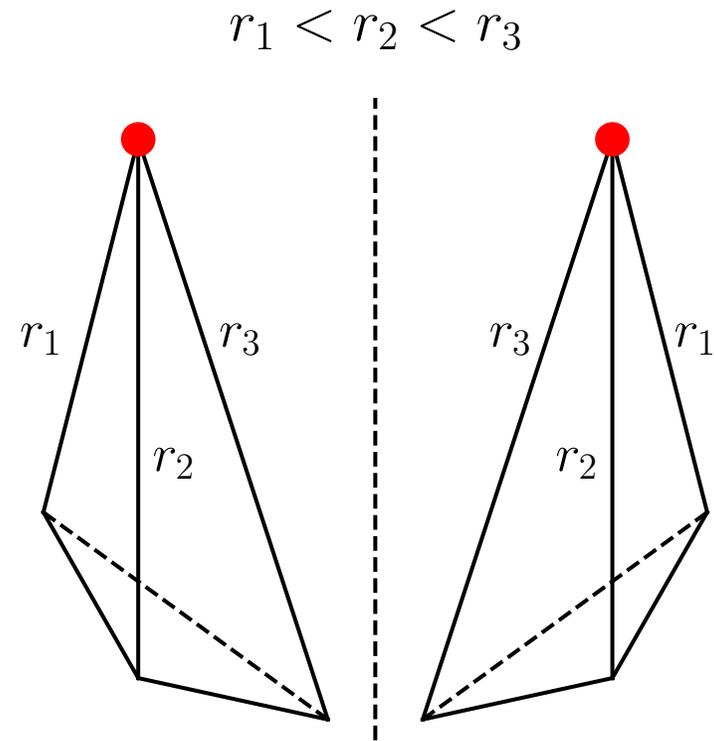
Peter Taylor



Mirror Asymmetry

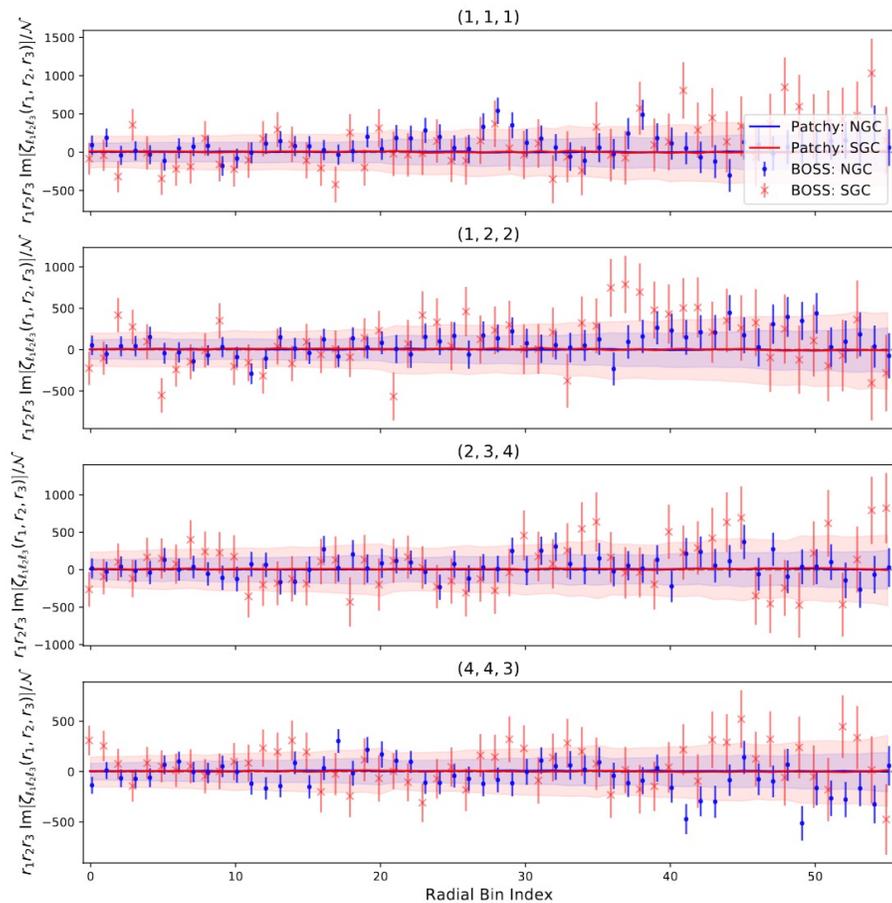


Parity Asymmetry

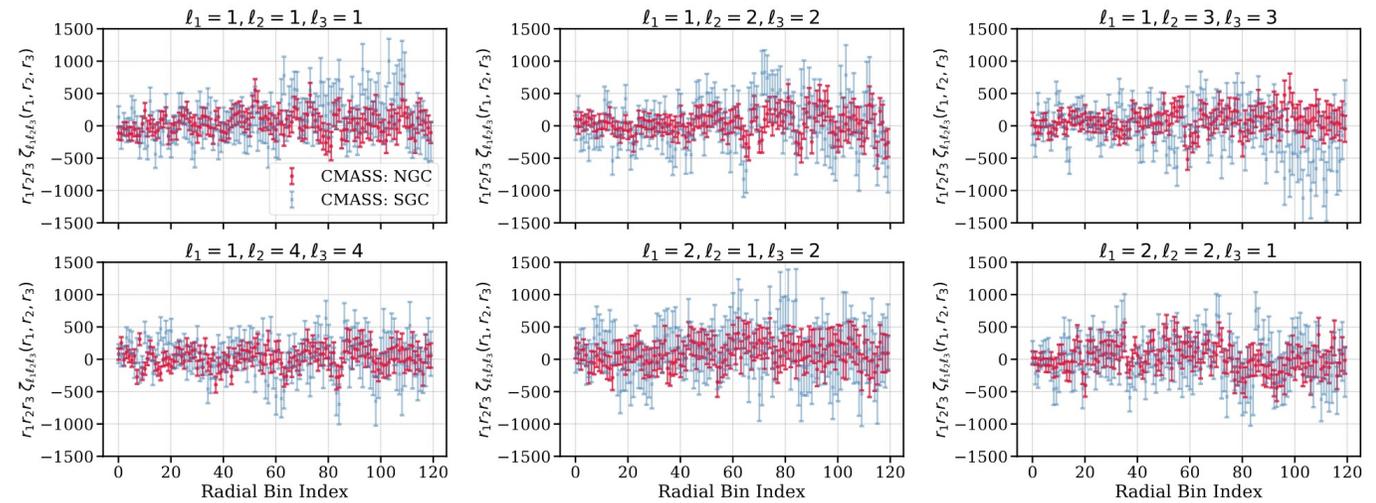


Possible Detections

2.9σ



7.1σ

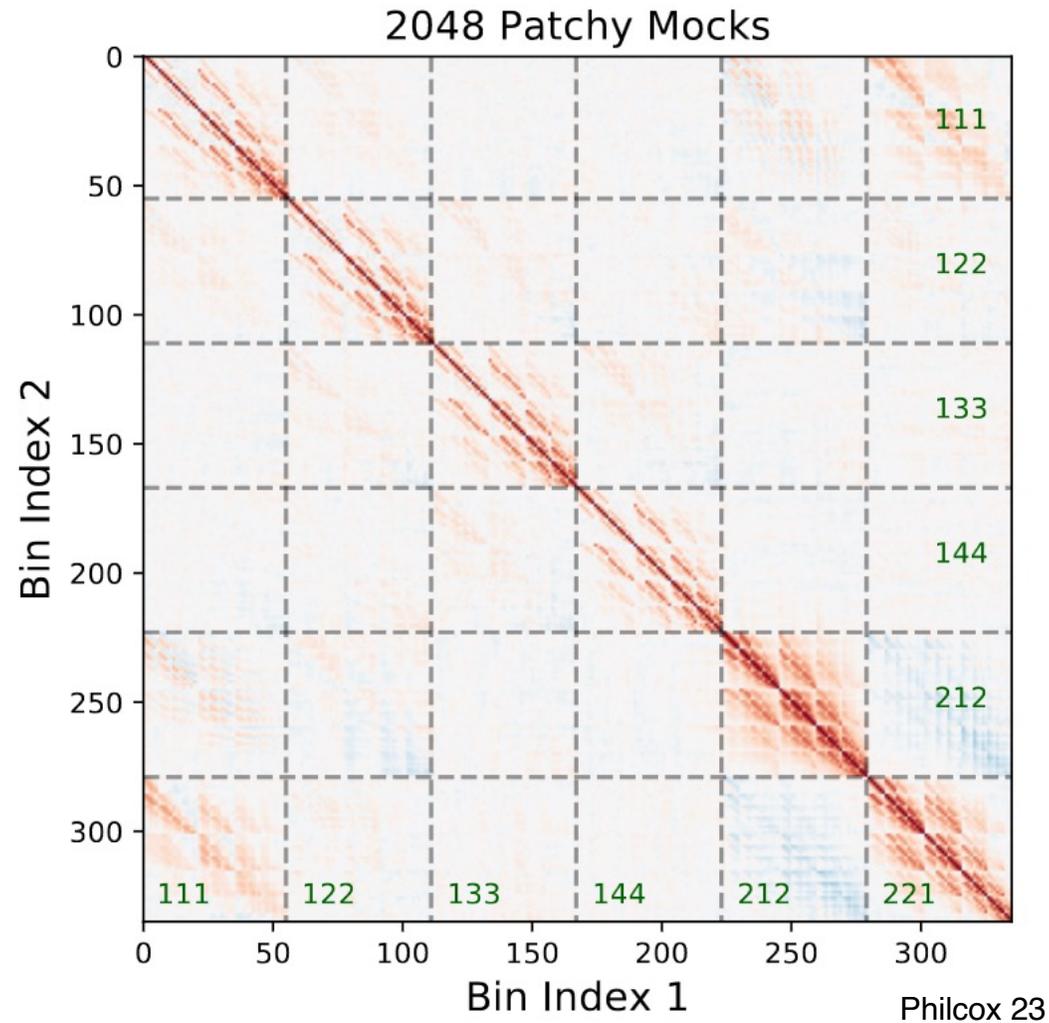


Interpretation

1. Observational Systematics
2. Exotic Inflationary Physics
3. Exotic Late Universe Physics
4. No detection at all...

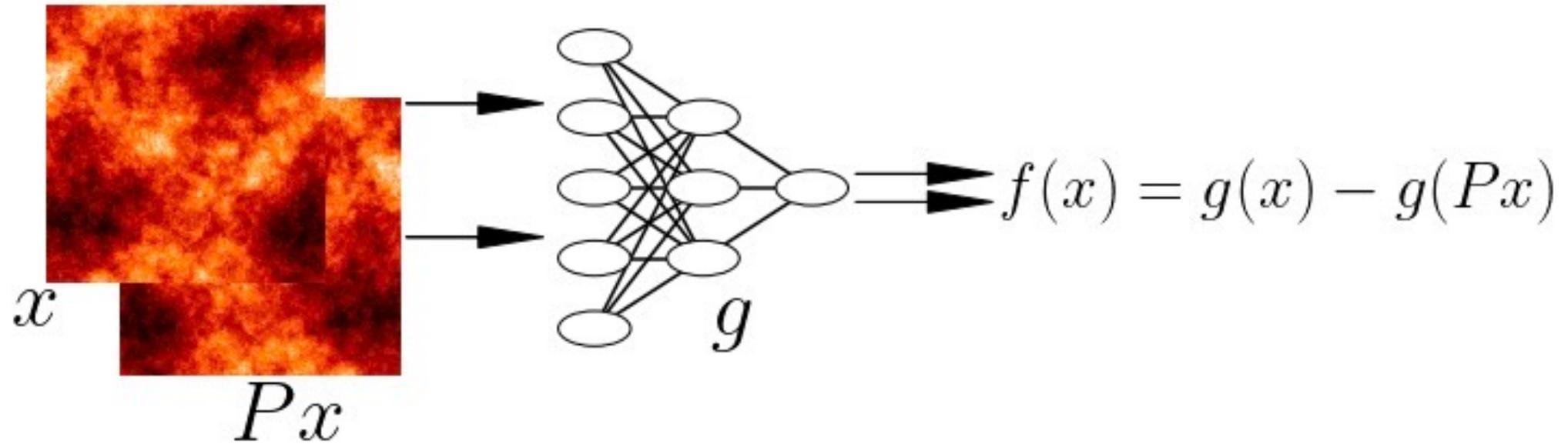
The Problem

Covariance is Difficult!

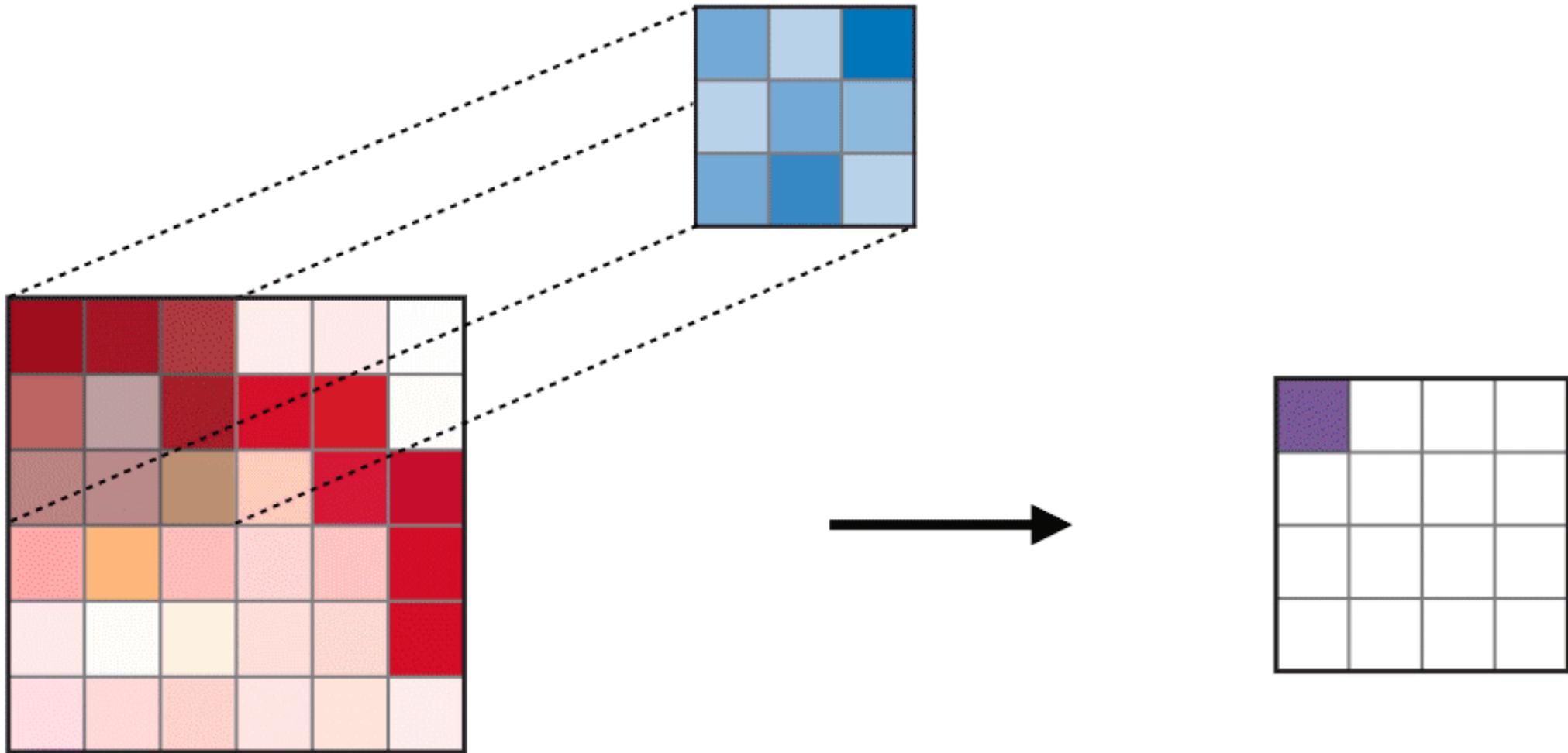


The Solution

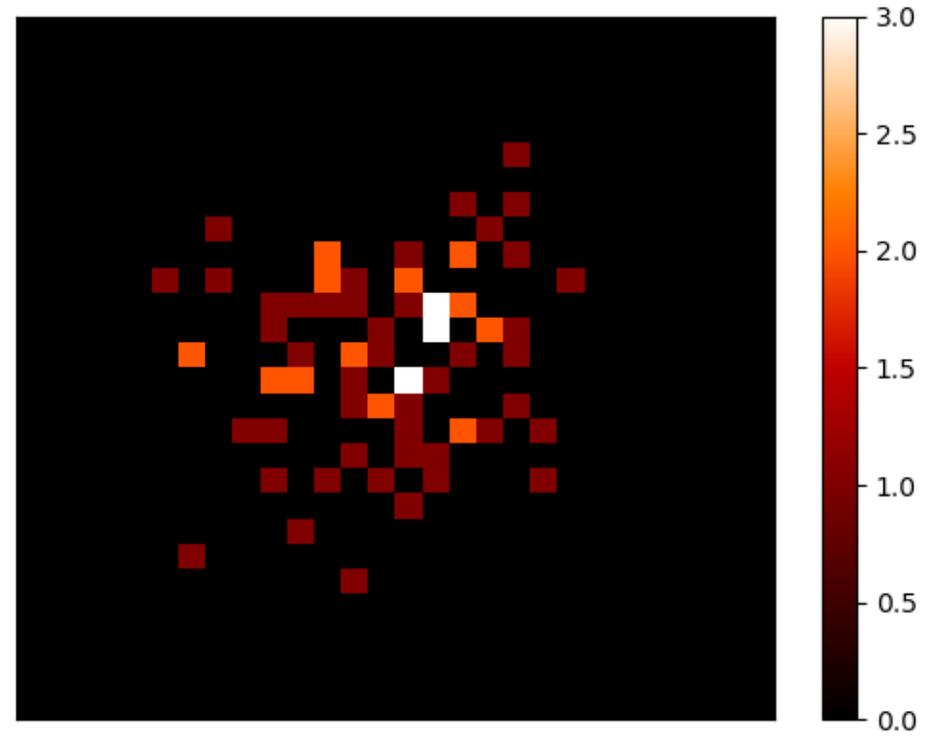
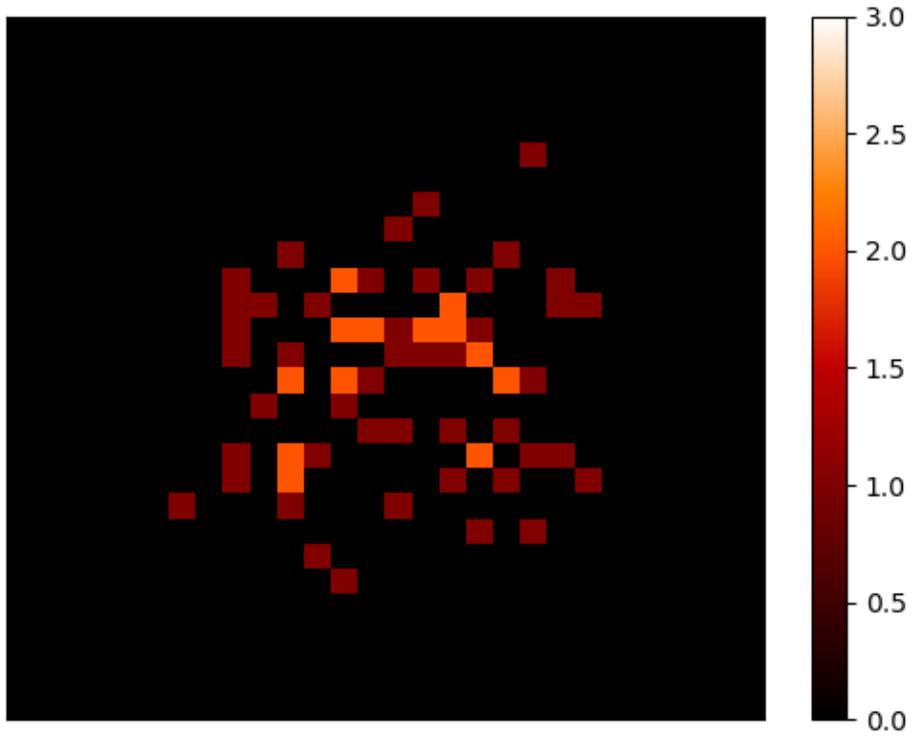
An Unsupervised Search



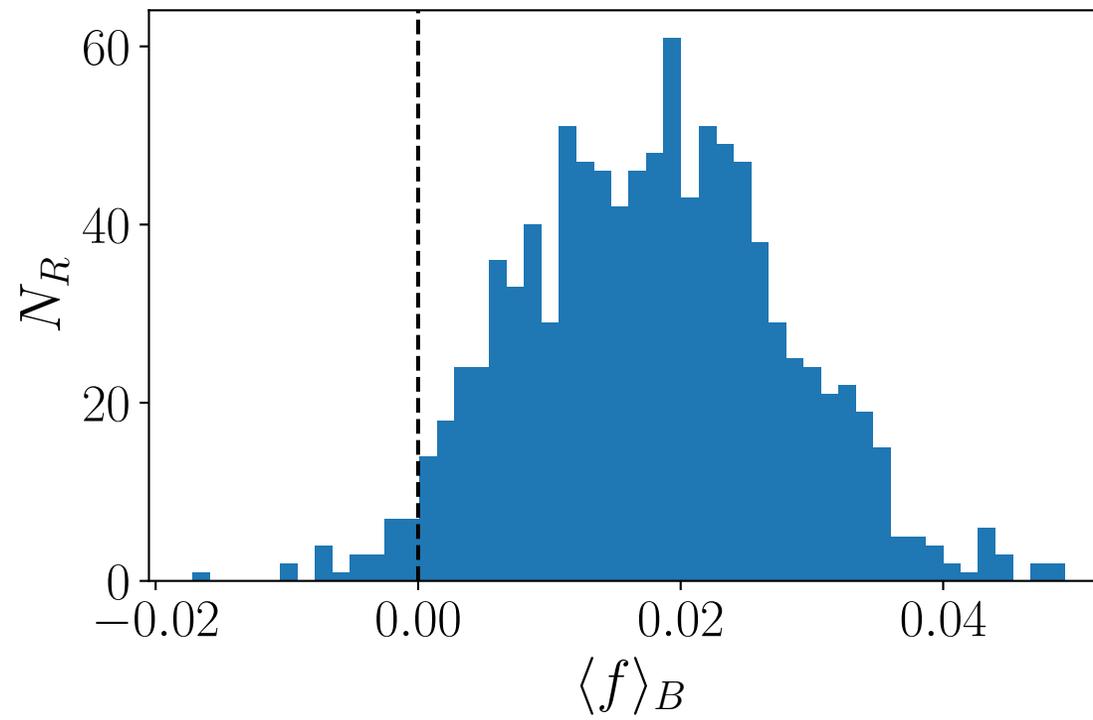
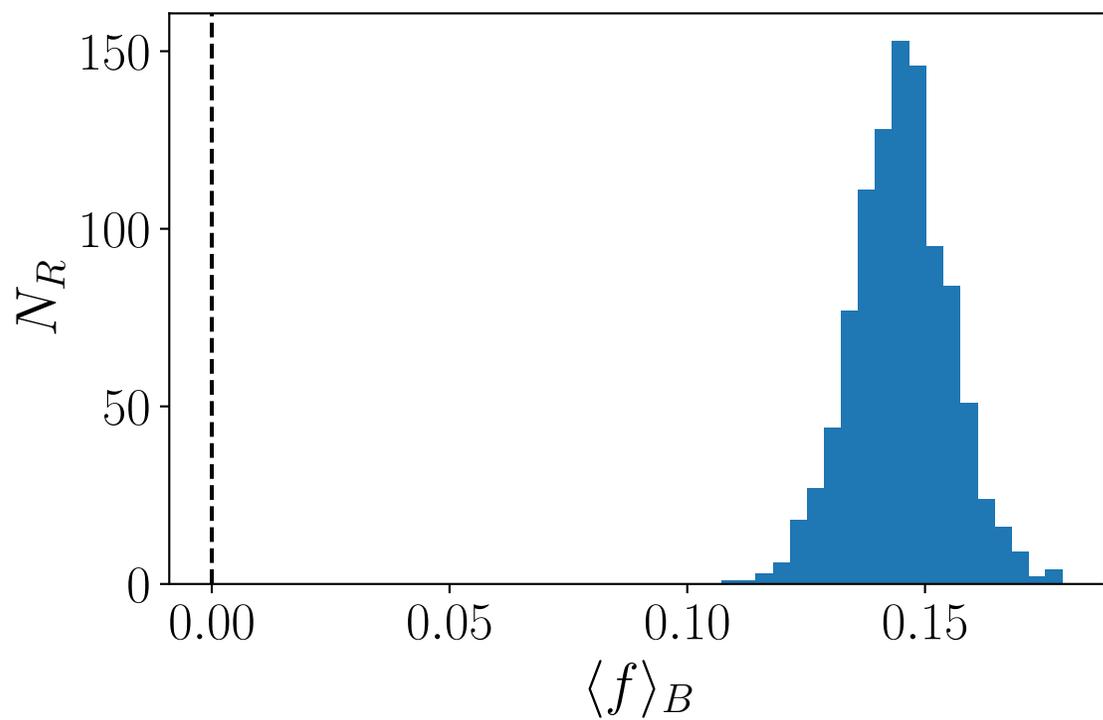
Convolution Neural Networks



2D Toy Model



2D Toy Model



3D is Hard!

Future Extensions

1. Scattering Wavelet Transform (w/ Matt Craigie)
2. 4, 5 and 6-point Analysis (w/ Jiamin Hou)

1. Other N-point Functions ($N > 4$)

