
The Pseudo-Cl Analysis Technique for Intensity Mapping

Christopher Anderson^{*1,2} and Eric Switzer¹

¹NASA Goddard Space Flight Center – United States

²Johns Hopkins University – United States

Abstract

The Pseudo-Cl technique has a long heritage for curved-sky analysis of the CMB. By computing the angular power spectrum across all pairs of spectral channels, $Cl(z,z')$, this technique can be easily adapted to 3-dimensional intensity mapping surveys. The $Cl(z,z')$ quantity contains all the information in the power spectrum, and it has several advantages to a traditional power spectrum analysis. It deals better with large surveys since no flat-sky approximation is required, it does not assume any underlying cosmology, it deals naturally with inhomogeneous angular and line-of-sight weights, and it naturally allows for the inverse covariance to be used to deweight foreground variance. The $Cl(z,z')$ technique is also simple to convert to fast Fourier analysis on small angular patches. I will explain the advantages of this analysis technique and highlight a recent example of the technique applied to a galaxy survey. I will also review my own work using this technique to cross-correlate FIRAS data with BOSS galaxies and to simulate the sensitivity of the EXCLAIM experiment, using a flat-sky version of $Cl(z,z')$.

*Speaker