Contribution ID: **116**   Type: **not specified**

First detection of Galaxy Cluster lensing in CMB polarisation

Monday 28 November 2016 14:20 (20 minutes)

Galaxy clusters are the largest gravitationally bound objects in the Universe and provide crucial insight to the standard model of cosmology. The abundance of these as a function of mass and redshift is highly sensitive to the cosmological parameters such as amplitude of matter fluctuations and dark energy equation of state parameter.

While galaxy clusters yield tremendously powerful tests of dark energy, their cosmological constraints are currently limited by a ˜15% mass uncertainty. Future surveys like LSST and eROSITA will build ever larger cluster samples; our ability to fully realise the potential of these samples depends on better mass estimates. Gravitational lensing is widely considered the gold standard in mass estimation.

The next suite of Cosmic Microwave Background (CMB) polarisation experiments are expected to be able to normalise cluster masses to ˜3% (a fivefold improvement!) by looking at the gravitational lensing signal in CMB polarisation. In this talk we present first ever lensing measurement of galaxy cluster mass using CMB polarisation data. We take data from the current SPTpol experiment, and use a maximum likelihood approach to extract the CMB cluster lensing signal from a catalog of Sunyaev-Zel'dovich effect selected galaxy clusters. We consider several sources of potential systematic error, and quantify their effect using mock data.

Summary

Author: PATIL, Sanjaykumar (University of Melbourne)

Co-author: Dr CHRISTIAN, Reichardt (University of Melbourne)

Presenter: PATIL, Sanjaykumar (University of Melbourne)

Session Classification: Cosmic microwave background and Large Scale Structure