



BISP8

**Eighth Workshop on  
BAYESIAN INFERENCE IN STOCHASTIC PROCESSES**

## **First analysis of Planck data using Bayesian source separation methods with Gaussian Markov random field priors**

Simon Wilson<sup>1</sup>, Jason Wyse<sup>1</sup>

<sup>1</sup> Trinity College Dublin, Ireland

Planck is a satellite that was launched in 2009 to map microwave radiation across the whole sky at 9 frequencies. Its primary mission finished in 2012 and its data were released publicly in March 2013. It has mapped the sky at resolutions up to 16 times finer than was possible before and with smaller measurement error.

The principal objective of the satellite is to provide data to map the Cosmic Microwave Background (CMB). Source separation methods are needed to separate out the signal from the CMB from other microwave sources. In this work we apply a Bayesian source separation method to produce estimates of the posterior distribution of CMB from the newly available Planck data. The spatial smoothness of the sources are modelled with Gaussian Markov random field priors. The computational difficulties in applying this method to Planck data are discussed.

### **Keywords:**

Factor analysis; Gaussian Markov random field; source separation.