

# Statistical properties of the CMB B-mode polarization leakage in an incomplete sky survey analysis

Larissa Santos  
University of Science and Technology of China  
China

The main goal of modern cosmology is to probe inflation by looking on the imprint of primordial gravitational waves in the cosmic microwave background (CMB) polarization field. The challenge of future CMB experiments is to measure this primordial magnetic component, the so-called B- mode polarization. The CMB sky is however filled with secondary B-mode signals, including the ones generated by CMB lensing and astrophysical foregrounds. The Galactic emission is one of the main contaminants, even when considering satellite surveys, and its signal must be excluded by the use of masks. A partial sky analysis of the polarization field leads to a leakage between E-modes and B-modes which adds an extra contamination. By employing the Minkowski functionals (MF) statistics, we intend to study the significance of the E-to-B leakage in the final CMB lensed B-maps. Finally, we find that the effect of leakage can be detected by the MF statistics and should not be neglected in future CMB data analysis. The leakage can also play a significant role as a contaminant for measuring the primordial B-mode signal and must be taken into account for a correct explanation of the data.