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Invited talk by Mathieu Remazeilles (IFCA Santander) on "Next steps in component separation for new CMB observables"

Wednesday, 25 May 2022 09:30 (30 minutes)

Beyond the significant legacy of the ESA's Planck mission, the cosmic microwave background (CMB) radiation carries much more information that remains to be exploited in the coming decades. Next-generation CMB experiments of unprecedented sensitivity are being planned to extract and interpret new cosmological observables out of future CMB data. Among these new, yet undetected, cosmological observables is the primary CMB B-mode polarization signal, but also secondary distortions to CMB anisotropies caused by the cosmic web, such as the relativistic SZ effect. A common aspect of these new cosmological signals is their very faint signature, furthermore obscured by intense astrophysical foreground emissions, which makes their recovery much more sensitive to foreground mismodeling, while the exact spectral properties of the foregrounds are also poorly known at the sensitivity levels required for these signals. I will discuss the problem of foregrounds and component separation for the search for such faint cosmological signals, and emphasize specific challenges in this context: foreground mismodeling, foreground spectral distortions, and spectral degeneracies versus frequency coverage. I will also present some recent developments in component separation which rely on statistical moment expansion of the foreground emission, and show how this offers an interesting avenue to overcome these new challenges.

Session Classification: Foregrounds