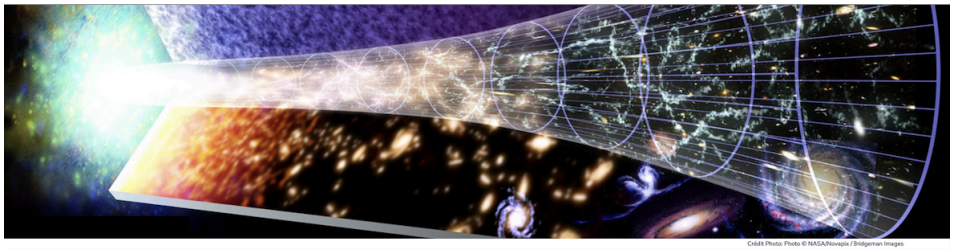

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# Spectral-Imaging with QUBIC : a new window to galactic foregrounds

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The Q&U Bolometric Interferometer for Cosmology (QUBIC) is the first bolometric interferometer that aims at measuring the primordial B-mode polarization of the CMB. A Technological Demonstrator working in the 150 GHz channel will observe the sky from Alto Chorillo, Argentina, starting from the end of 2022. Subsequently, the full instrument will be operational and observe in two frequency bands, centered at 150 GHz and 220 GHz.
Bolometric interferometry is a novel technique that combines the sensitivity from bolometric detectors with the control of instrumental systematic effects from interferometry. Furthermore, a unique feature of bolometric interferometry is spectral imaging: the ability to recover the sky signal in several sub-bands within the physical band, providing a spectral resolution unattainable for a traditional imager ($\Delta\nu/\nu \sim 0.04$).
In this study we investigate how the increased spectral resolution provided by Bolometric Interferometry can resolve Galactic foreground complexity and provide robustness to foreground mitigation for primordial B-mode studies. For this purpose, we addressed the component separation procedure for two different experimental configurations. The first one consists of the anticipated CMB-S4 sensitivities and frequency coverage; for the second one, we extended the CMB-S4 set up with QUBIC spectral resolution (corresponding to a bolometric interferometry version of the same experiment).
Our results indicates that unaccounted dust frequency decorrelations lead to a biased result of the order of r ⊠ 10−3. However, when changing the spectral resolution, the bias also changes thus hinting that the estimated r is not due to primordial CMB B-modes.

**Presenter:** RÉGNIER, Mathias